United States Department of Agriculture
Forest Service

UPPER BRIGGS RESTORATION PROJECT

BOTANICAL REPORTS
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UPPER BRIGGS RESTORATION PROJECT

Biological Evaluation for Threatened, Endangered, and Sensitive Plants, Lichen, and Fungi

Wild Rivers Ranger District, Rogue River Siskiyou National Forest, Josephine County, Oregon




PREPARED BY: /s/ Stuart Osbrack DATE: January 12, 2017
Stuart Osbrack District Botanist

SUMMARY OF FINDINGS

There are occurrences of four different Rogue River-Siskiyou National Forest sensitive plant species within the Upper Briggs Restoration Project footprint. They include one occurrence *Iliamna lactibracteata* (California globe-mallow), one occurrence of *Pyrola dentata* (toothed wintergreen), seven occurrences of *Cypripedium fasciculatum* (clustered lady's-slippers) and numerous occurrences of the sensitive plant species *Sophora leachiana* (western sophora) within the proposed project footprint. All occurrences found during floristic surveys conducted for the proposed project or were previously known and documented.

Design features have been created for all Rogue River-Siskiyou National Forest (RRSNF) sensitive plant species within the proposed Upper Briggs Restoration Project area to ensure that all occurrences do not receive negative impacts from the proposed project implementation. However, some occurrences could receive long-term benefits from the proposed project implementation.

Strategic and Survey and Manage species found within the project area will be discussed in a separate specialist report. Invasive plants and noxious weeds will be discussed in the Invasive Plant Risk Assessment.

Based on the description of the proposed action and the evaluation contained herein, I have determined the following:

- There would be **no effect** to *Fritillaria gentneri* (Gentner's fritillaria), *Arabis macdonaldiana* (Maccdonald's rock cress), or *Lomatium cookii* (Cook's lomatium), or any other plant species listed as threatened, endangered, proposed for listing, or candidates under the Endangered Species Act of 1973, as amended (ESA), administered by the U.S. Fish and Wildlife Service (USFWS) from the proposed Upper Briggs Restoration Project. This determination is based on the absence of suitable habitat within the project area and the absence of individuals known or expected to occur within the project area.

- There would be **no impact** to the following Rogue River Siskiyou National Forest sensitive species; this determination is based on the absence of suitable habitat within the project area and the absence of individuals known or expected to occur within the project area**:**

  <u>Vascular Plants</u>

  Arabis modesta (Rogue canyon rockcress), Arctostaphylos hispidula (hairy manzanita), *Arnica viscosa* (Shasta arnica), *Asplenium septentrionale* (grass fern), *Bensoniella oregana* (bensonia), *Boechera horizontalis* (Crater Lake rockcress), *Botrychium pumicola* (pumice grapefern), *Calochortus howellii* (Howell's mariposa-lily), *Camassia howellii* (Howell's camas), *Carex capitata* (capitates sedge), *Carex comosa* (bristly sedge), *Carex diandra* (lesser panicled sedge), *Carex klamathensis.*(Klamath sedge), *Carex lasiocarpa* var. *americana* (slender sedge), *Carex nervina* (Sierra nerved sedge), *Castilleja schizotricha* (split-hair paintbrush), *Cheillanthes intertexta* (coastal lip-fern), *Chlorogalum angustifolium* (narrow-leaved

amole), *Collomia mazama* (Mt. Mazama Collomia), *Corydalis aquae-gelidae* (cold-water corydalis), *Cryptantha milo-bakeri* (Milo baker's cryptantha), *Cyperus acuminatus* (short-pointed cyperus), *Delphinium nudicale* (red larkspur), *Dicentra pauciflora* (few-flowered bleeding heart), *Diplacus bolanderi* (Bolander's monkeyflower), *Diplacus congdonii* (Congdon's monkeyflower), *Draba howellii* (Howell's whitlow-grass), *Epilobium oreganum* (Oregon willow-herb), *Epilobium siskiyouense* (Siskiyou willow-herb), *Erigeron cervinus* (Siskiyou daisy), *Erigeron petrophilus* (Cliff daisy), *Erigonum lobbii* (Lobb's buckwheat), *Erythronium howellii* (Howell's adder-tongue), *Eschscholzia caespitosa* (gold poppy), *Frasera umpquaensis* (Umpqua Swertia) *Gentiana newberryi* (Newberry's gentian), *Gentiana plurisetosa* (elegant gentian), *Gentiana setigera* (Waldo gentian), *Hackelia bella*, (beautiful stickseed), *Hastingsia Bracteosa* var. *atropurpurea* (purple rush-lily), *Hastingsia Bracteosa* var. *bracteosa* (large-flowered rush-lily), *Hesperocyparis bakeri* (Baker's cypress),*Hiericium horridum* (shaggy hawkweed), *Horkelia hendersonii* (Henderson's horkelia), *Horkelia tridentata* ssp. *tridentata* (three-toothed horkelia), *Lewisia leeana* (Lee's lewisia), *Limnanthes alba* ssp. *gracilis* (slender meadow foam), *Limnanthes floccosa* ssp. *bellingeriana* (Bellinger's meadow foam), *Lomatium engelmanii* (Engelman's desert-parsley), *Lupinus aridus* var. *ashlandensis* (Mt. Ashland lupine), *Lupinus tracyi* (Tracy's lupine), *Ophioglossum pusillum* (adders-tongue), *Perideridia erythrorhiza* (red-rooted yampah), *Phacelia leonis* (Siskiyou Phacelia), *Pilularia americana* (American pillwort), *Pinus albicaulus* (Whitebark Pine), *Plagiobothyrs figuratus* ssp. *corallicarpus* (coral seeded allocarya), *Plagiobothrys greenei* (greene's popcorn flower), *Poa rhizomata* (timber bluegrass), *Polystichum californicum* (California sword-fern), *Prosartes parvifolia* (Siskiyou fairy bells), *Rafinesquia californica* (California chicory), *Rhamnus ilicifolia* (redberry), *Rhynchospora alba* (white-beaked rush), *Ribes divaricatum* var. *pubiflorum* (straggly gooseberry), *Romanzoffia thompsonii* (Thompson's mistmaiden), *Rorippa columbiae* (Columbia cress), *Saxifragopsis fragarioides*, joint-leaved saxifrage), *Scheuchzeria palustris* var. *americana* (sheuchzeria), *Schoenoplectus subterminalis* (water clubrush), *Scirpus pendulus* (drooping bulrush), *Scoliopus bigelovii* (California fetid adderstongue), *Sedum moranii* (Rogue River stonecrop), *Sidalcea malviflora* ssp. *patula* (coast checker bloom), *Silene hookeri* ssp. *bolanderi* (Bolander's catchfly), *Streptanthus glandulosus* (common jewelflower), *Streptanthus howellii* (Howell's streptanthus), *Tauschia howellii* (Howell's tauschia), *Tetrapteron graciliflorum* (slender-flowered evening-primrose), *Trillium kurabayashii* (Sisikiyou trillium), *Utricularia minor* (lesser bladderwort), *Viola primulifolia* ssp. *occidentalis* (western bog violet), *Wolffia columbiana* (Columbia water-meal), *Zigadenus fontanus* (small-flowered death camas)

Bryophytes

Anastrophyllum minutum, Andreaea schofieldian, Bryum calobryoides, Calypogeia sphagnicola, Cephaloziella spinigera, Cryptomitrium tenerum, Encalyptra brevicollis, Encalyptra brevipes, Harpanthus flotovianus, Kurzia makinoana, Lophozia gillmanii, Orthodontium gracile, Orthodontium pellucens, Psuedocalliergon trifarium, Racomitrium depressum, Rivulariella gemmipara, Schistidium cinclidodonteum, Tortula mucronifolia (moss)

Lichens
Bryoria subcana , Leptogium cyanescens, Lobaria linita, Ramalina pollinaria,

Fungi
Albatrellus avellaneus, Dermocybe humboldtensis, Gastroboletus vividus, Gastrolactarius camphoratus, Gymnomyces fragrans, Ramaria amyloidea , Ramaria rubella forma blanda, Rhizopogon chamaleontinus, Stagnicola perplexa,

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species** has been determined for the following Rogue River Siskiyou National Forest sensitive species

Vascular Plants
Adiantum jordanii (California Maiden-hair), Allium peninsulare (peninsular onion), Cheilanthes covillei (Coville's lip-fern), *Cryptantha simulans* (pine woods cryptantha), *Ericameria arborescens* (goldenfleece), *Keckelia lemmonii* (bush beardtongue), *Lotus stipularis* (stipuled trefoil), *Pellea andromedifolia (coffee fern), Pellea mucronata ssp. californica (birds-foot fern), Rhamnus ilicifolia* (redberry), *Solanum parishii* (Parish's horse-nettle)

Bryophytes
Entosthodon fascicularis, Porella bolanderi,

Fungi
Chamonixia caespitosa, Phaeocollybia californica, Pseudorhizina californica, Rhizopogon ellipsosporus, Rhizopogon exiguous

No individuals or populations are known from the project footprint and none were located during project surveys. This determination is based on the presence of suitable habitat within the project footprint. These species may be affected during project implementation if undetected individuals or populations are present within the project area where suitable habitat occurs.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Cypripedium fasciculatum* (clustered lady's-slippers). This species is known from 7 locations in the project footprint. There are occurrences in units 3, 21, 22, 23A, 24, 63, 508, and 509. Design features have been created to eliminate any direct effects to these populations. However, this species may be negatively impacted during project implementation if undetected individuals or populations are present but were not detected within the project area where suitable habitat occurs.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Iliamna lactibracteata* (California globe-mallow).

This species is known from locations in the project footprint. Populations are in units 3, 14, and 50. Design features have been created to eliminate any direct effects to this population. However, this species may be negatively impacted during project implementation if undetected individuals or populations are present but were not detected within the project footprint where suitable habitat occurs. Long term beneficial effects are anticipated from project implementation. The species depends on disturbance specifically fire and open canopies and to regenerate, propagate, and maintain viable populations.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Pyrola dentata (toothed wintergreen).* This species is known from one location in the project footprint. The occurrence is in unit 47. Design features have been created to eliminate any direct effects to this population. However, this species may be negatively impacted during project implementation if undetected individuals or populations are present but were not detected within the project footprint where suitable habitat occurs. Long term beneficial effects are anticipated from project implementation. The species depends on disturbance specifically fire and open canopies and to regenerate, propagate, and maintain viable populations.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Sophora leachiana* (western sophora). This species is known from many locations within the project footprint. There are occurrences in units 2, 3, 3S, 5, 9, 14, 15, 16, 35, 48, 240, 262, 503, 504, 505, 506, 510, and 652. Design features have been created to minimize adverse impacts to these populations. Short term impacts and direct effects may occur during project implementation. However, this species needs disturbance and open canopies to survive, propagate, and thrive. Long term effects will beneficial to the species and occurrences. There may be additional adverse impacts during project implementation if undetected individuals or populations are present but were not detected within the project footprint where suitable habitat occurs.

I. INTRODUCTION

The purpose of this Biological Evaluation is to document Forest Service programs or activities in sufficient detail to determine how an action or proposed action may affect any threatened, endangered, proposed, candidate, or sensitive species and their habitats (FSM 2670.5). FSM 2672.4 directs us to complete the biological evaluation for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on Federally listed threatened, endangered, proposed, candidate, or species listed as sensitive by the Pacific Southwest Regional Forester. Part of the biological evaluation is completed to determine whether a proposed action or any of the alternatives will result in a trend toward the sensitive species becoming federally listed. The goals of a BE are to:

- To ensure that Forest Service actions or funding of actions do not contribute to the loss of viability of any native or desired non-native plant or animal species;
- To ensure that Forest Service actions or funding of actions do not hasten the federal listing of any species; and
- To provide a process and standard through which TES species receive full consideration throughout the planning process, thereby reducing negative impacts to species and enhancing opportunities for mitigation.

II. PROJECT DESCRIPTION:

The purpose of this project is to improve the overall resiliency of the Upper Briggs Creek watershed to short-term disturbance (fire, drought, storms) and long-term climate change. Identified needs in the watershed include:

1. Strategically manage fuels to reduce the risk of large stand-replacing fires and reintroduce controlled fire use to the landscape.
2. Maintain and restore structural and vegetation diversity (species composition and successional stages) as appropriate to abiotic and biotic site characteristics in upland areas (prolonging the persistence of legacy trees, accelerating development of late seral forest structure; restoring pine/oak, meadow habitats and rare plant populations).
3. Conserve and enhance habitat for the northern spotted owl and other wildlife species.
4. Maintain and restore the species composition and structural diversity of plant communities in riparian reserves and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration; supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.
5. Re-establish more natural subsurface flow patterns and improve overall watershed function.

Proposed Action (Alternative 2) and Alternative 3

The Wild Rivers Ranger District proposes to treat up to approximately 4000 acres of NFS land in the Upper Briggs Creek watershed. The following proposed activities are collectively intended to contribute to landscape-level restoration within the Briggs Valley area. (Numbers in parentheses refer to purpose statements above).

Develop and Enhance Late Seral Habitat (DELSH)

- Implement treatments (e.g., group selection, patch creation, variable density or radial thinning) to promote sustainable multi-storied stand structure and development of large trees with desirable crown depth in existing mid-seral stands or habitats that lack characteristics of high quality nesting/roosting/foraging habitat for northern spotted owls (2, 3). (Northern spotted owl recovery action 10)
- Use group selection to create small openings or enhance existing small openings in areas with homogenous habitat that lack desired species and structural diversity for owl habitat (2, 3).
- Enhance and protect species diversity through control of the spread of disease agents (dwarf mistletoe and root rot). Increase stand resiliency to western pine beetle and *Ips pini* by variable density thinning (1, 2, 3, 4).

Restore Pine-Oak Communities

- Use a combination of variable density thinning and radial thinning of healthy dominate large trees to 1) reduce mortality of shade-intolerant species such as ponderosa pine, sugar pine, black oak, and white oak and 2) to create conditions where shade-intolerant species can establish. Thinning would include commercial trees, pre-commercial trees, and woody understory species (2, 3).
- Retain and restore pine-oak habitats by removing encroaching species and reducing competition for light and nutrients from existing and remnant pine-oak communities (1, 2, 3).
- Utilize underburning to enhance and maintain healthy pine-oak habitat and assure its persistence in the watershed (1, 2, 5).

Restore Sensitive Plant Habitat

- Reduce canopy cover and create openings for shade-intolerant sensitive plants (2).
- Use techniques to mimic natural disturbances that perpetuate these species, including fire (1).

Restore Meadow Systems

- Remove encroaching tree and shrub species to restore and maintain meadow boundaries (2).
- Improve habitat transition between meadow and forested boundaries (2, 5).
- Utilize broadcast burning to replicate natural meadow disturbance processes (1, 5).

Restore Riparian Reserves

- All project activities within riparian reserves will maintain or improve ACS objectives as defined in the NWFP. Timber harvest within riparian reserves will only occur where needed to attain ACS objectives (4, 5).
- Increase instream coarse woody debris where it is deficient, and ensure adequate future delivery of coarse woody debris to stream channels (2, 4, 5).
- Increase the amount of large downed wood and number of snags in riparian reserves where they are deficient (4, 5).
- Use variable density or radial thinning, group selection, prescribed fire, directional falling, and/or invasive plant removal to improve the diversity and composition of plant species within the riparian reserve to provide adequate temperature regulation, nutrient filtering, stream bank stability, and amounts of coarse woody debris (2, 4).

Create and Maintain Strategically Located Fuel Management Zones

- Create and maintain strategically located shaded fuel breaks, based on prevailing fire weather conditions and fire behavior; ridgetop fuel breaks will extend to both sides of the ridge (1, 2, 3, 4).
- Reduce ladder fuels through mechanical treatment and underburning (1, 2, 3, 4).
- Reduce hazardous fuels, reduce crown fire potential, and create conditions that reduce the probability of stand-replacing wildfire. Focus treatments on hotter and drier south and west-facing aspects. (1, 2, 3, 5).

Decrease Road Impacts to Watershed Function

- Close, obliterate, or convert to another use those roads that are no longer needed for access. For roads that are obliterated or placed into long term storage use treatments to improve hydrologic function, including: remove culverts at stream crossings; re-contour channels to mimic the natural condition; sub-soil the road bed where necessary to improve water infiltration, soil productivity, and revegetation; place woody debris to decrease erosion and enhance vegetation recovery (5).

The proposed treatments discussed above are categorized by objective in the table below. Total acres displayed exceeds the total treatment area, due to multiple objectives in some treatment units. Overlap acres shows the breakdown.

Table 1.
Upper Briggs Restoration Action Alternatives Comparison

Treatment Objective	Activities	Alternative 2*	Alternative 3*
Develop and Enhance Late Seral Habitat	Variable density thinning, gap creation, thin from below; commercial and non-commercial material; maintain with underburning where appropriate	1796	1026
Pine-Oak Restoration	Thin from below, pruning, lop and scatter, pile burning; commercial and non-commercial material; maintain with underburning	714	518
Riparian Reserve Restoration	Variable density thinning, to enhance structural diversity and accelerate late seral development; limited commercial material; underburn where appropriate	183	76
Fuel Management Zones	Thin from below with variable density thinning; pruning, lop and scatter, pile burning; commercial and non-commercial material; maintain with underburning	2640	1633
Meadow Restoration	Removal trees encroaching meadow; variable density thinning in meadow-forest interface; lop and scatter, pile burning; commercial and non-commercial material; maintain with underburning	188	188
Rare Plant Enhancement	Habitat creation and enhancement; maintain with underburning in open habitats	333	197

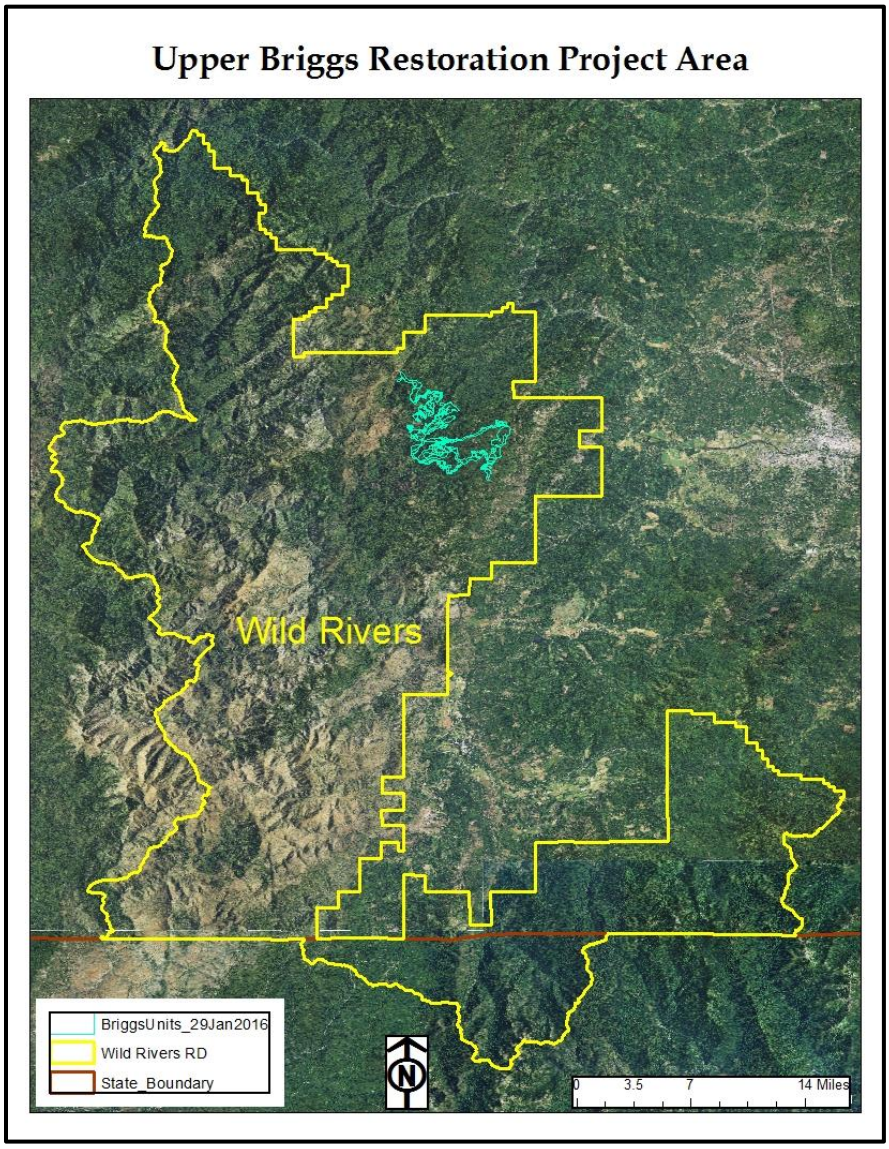
*Total acres designed to meet an objective. Many units are designed to meet multiple objectives, so total acres exceeds the total amount proposed to be treated. Total treatment acres for each alternative is Alternative 2 = 4017 acres and Alternative 3 = 2628 acres total

The proposed treatments above would require the use of the forest system roads and would require approximately three miles of temporary spur roads. Haul route for excess or sale material would use FSR 2500.

Prescribed fire would be used for fuel reduction and to maintain treatment effectiveness over time.

LOCATION:
This project is located in the Wild Rivers Ranger District, Rogue River-Siskiyou National Forest in Briggs Valley approximately 9 air miles SW of the Rogue River and 13 air miles WNW of Grants Pass, Oregon. The project area lies entirely within the Briggs Creek watershed which is a tributary of the Illinois River. The entire project area is non-WUI (not wildland-urban interface). A 160 acre parcel of private land (with residence) lies within the general project area. This parcel is completely surrounded by National Forest lands. The legal description is:

- Selma USGS 7.5-minute quadrangle; Willamette Meridian:
  T 35S R 8W Section 25, 31, 32
  T 36S R 8W Section 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29



III. PRE-FIELD REVIEW OF EXISITNG INFORMATION

A pre-field review of existing information from the RRSNF flora atlases and available GIS coverages was performed to evaluate the extent of potential habitat and known populations of Threatened, endangered, and sensitive plants within the proposed project areas.

Table 2.
Sensitive species with potential habitat in the Upper Briggs Valley Project Footprint

Species	Known to occur in project area	Documented on the RRS NF	Habitat
Adiantum jordanii (California Maiden-hair)		Yes	Shaded hillsides, moist woods; less than 5000 ft.
Allium peninsulare (peninsular onion)	No	No	Dry slopes less than 4000 ft.
Chamonixia caespitosa (fungi)	No	Yes	It has been found in association with the roots of hemlock species and Pacific silver fir in high elevation forests and western hemlock, Douglas fir and, Sitka spruce in coastal forests.
Cheilanthes covillei (Coville's lip-fern)	No	Yes	Crevices, bases of rocks, sun or shade at elevation from 1,900- 7,800 ft.
Cypripedium fasciculatum (clustered lady's-slippers)	Yes	Yes	Closed canopy forest with 60% cover. Found at elevations from 1,000-3,500 ft. Requires mycorrhizal soils.
Cryptantha simulans (pine woods cryptantha)	No	No	Dry Gravelly sites, disturbed areas, open coniferous forest; 1500-8500 ft.
Ericameria arborescens (golden fleece)	No	Yes	Woodland, forest esp. after fire below 5500 ft.
Entosthodon fascicularis (moss)	No	No	Moist bare soils
Iliamna lactibracteata (California globe-mallow)	Yes	Yes	Riparian; wet places; shady, disturbed ground at elevations from 200-2,500 ft.
Keckelia lemmonii (bush beardtongue)	No	Yes	Yellow Pine Forest, Red Fir Forest, Mixed Evergreen Forest, Northern Oak Woodland. Elevation Range is from 650-6,200 ft.
Lotus stipularis (stipuled trefoil)	No	Yes	Thickets, chaparral, logged areas; 4000 ft.
Pellea andromedifolia (coffee fern)	No	No	Generally rocky or dry areas; 100-6000 ft.
Pellea mucronata ssp. californica (birds-foot fern)	No	No	Rocky or dry areas; 6000-10000 ft.
Phaeocollybia californica (fungi)	No	Yes	Doug Fir habitat
Porella bolanderi (liverwort)	No	Yes	Forming shaded to partly exposed mats on a variety of rock types (siliceous, calcareous, and metamorphic) and trunks of Quercus, Umbellularia, and Acer macrophyllum; 500-3000 ft.
Pseudorhizina californica (fungi)	No	Yes	Doug fir Ponderosa Pine only 4% occurrences but habitat in litter; rotten logs skid trail disturbed areas; 668-6515 ft.

Species	Known to occur in project area	Documented on the RRS NF	Habitat
Pyrola dentata (toothed wintergreen)	Yes	Yes	Upland dry sites; serpentine and non-serpentine substrates; elevation from 180-9500 ft.
Rhamnus ilicifolia (redberry)	No	Yes	Chaparral, montane forests at elevations below 6,500 ft.
Rhizopogon ellipsosporus (fungi)	No	Yes	Douglas-fir/tanoak series/wet Douglas-fir/wet Douglas-fir-incense cedar association. Elevation of the sites ranges from 1,040 feet to 4,116 feet.
Rhizopogon exiguous (fungi)	No	Yes	Douglas-fir series/wet Douglas-fir habitat association. 16 m. (54 feet) to 1,172 m
Solanum parishii (Parish's horse-nettle)	No	Yes	Dry chaparral, oak/pine woodland, pine forest. Found at elevation below 6500 ft.
Sophora leachiana	Yes	Yes	Disturbance and open, sunny habitat within conifer-oak woods.

IV. CURRENT MANAGEMENT DIRECTION

THREATENED & ENDANGERED SPECIES

It is mandate that the Forest Service (FS) conduct its activities and programs to assist in the identification and recovery of threatened and endangered plant species and avoid actions which may cause a species to become threatened or endangered. The FS will not approve, fund or take any action that is likely to jeopardize the continued existence of threatened and endangered species or destroy any habitat necessary for their conservation unless exemption is granted pursuant to subsection 7(h) of the Endangered Species Act (ESA) of 1973, as amended (FSM 2601.2).

The most recent Federally Threatened, Endangered, and Proposed Species lists was updated on October 17, 2016. This list was accessed on January 11, 2017 from the USFWS website (https://www.fws.gov/oregonfwo/Documents/OregonSpeciesStateList.pdf). This list fulfills the requirements of the USFWS to provide a current species list pursuant to section 7 of the ESA. The RRSNF currently has two known and one suspected plant species that are listed as threatened or endangered under the ESA; however, these three plant species have no potential habitat within the proposed project footprint.

FOREST SERVICE SENSITIVE PLANTS

Sensitive plants are plant species the Forest Service Regional Forester has identified in which population viability is of concern. The determination is based on the following; significant current or predicted downward trends in population numbers or predicted downward trends in suitable habitat that would reduce a species' existing distribution. (FSM 2670.5) Sensitive plant species must receive special management to ensure their viability and to preclude trends that would result in the need for Federal listing. (FSM 2672.1) Forest Service sensitive species policy directs the Forest Service to avoid or minimize impacts to species whose

viability has been identified as a concern. (FSM 2670.32) The USDA Forest Service's botanical sensitive species list is based on the Pacific Northwest Region's list of 2016. These lists are the most current versions for the RRSNF.

V. EXISTING CONDITION AND AFFECTED ENVIRONMENT

The following briefly summarizes the habitats or plant communities that occur in the project area.

Within the project area there exist several types of habitats and plant communities. Plant communities differ within the project area depending on geology, aspect, slope, available moisture, percent canopy cover, and other ecological attributes. The dominant plant community type is *Psuedotsuga menziesii* (Douglas fir)-*Lithocarpus densifolius* (tanoak). Within the project footprint there exists an overstory of *Psuedotsuga menziesii* (Douglas fir), *Quercus kelloggii* (black oak), *Pinus ponderosa* (ponderosa pine), *Arbustus menziesii* (pacific madrone), *Pinus lambertiana* (sugar pine), *Calocedrus decurrens* (incense cedar) and others. The shrub layer consists of *Lithocarpus densifolius* (tanoak), *Amelanchier* sp. (serviceberry), *Rhamnus purshiana* (cascara), *Corylus cornuta* (hazelnut), *Holodiscus discolor* (oceanspray), *Mahonia nervosa* (Oregon grape), *Salix* spp. (willow), *Ceanothus cuneatus* (buckbrush), and *Ceanothus cordulatus* (white thorn), *Ribes* spp. (current), *Arctostaphylos patula* (green leaf manzanita) *Rosa* spp. (rose), and others. There is a diverse layer of forbs, graminoids, and non-vascular species distributed throughout the project area. There is mixed conifer and hardwood forest, shrub, riparian, meadow, roadside, other ecosystems within the project footprint. Forest areas vary in tree size and age, canopy closure, downed woody debris and decay class. The project footprint ranges from 2200- 4300 feet in elevation.

Within the footprint of the proposed project there is potential habitat for multiple RRRSNF sensitive plant, lichen, and fungi species. Only *Cypripedium fasciculatum* (clustered lady's-slippers), *Iliamna lactibracteata* (California globe-mallow), *Pyrola dentata* (toothed wintergreen), and *Sophora leachiana* (western sophora) have occurrences within and adjacent to the units.

Table 3.
Known occurrences of RRSNF Sensitive Plant Species within the proposed project footprint

Species	Common Name	Unit Alt 2	Unit Alt 3
Cypripedium fasciculatum	(clustered lady's-slippers)	3, 21, 22, 23A, , 63, 508, 509	3, 23A 63, 508, 509
Iliamna lactibracteata	(California globe-mallow)	3, 14, 50	(70 feet from unit 3)
Sophora leachiana	(western sophora)	2, 3, 3S, 5, 9, 14,15, 16, 35, 48, 240, 262, 503, 504, 505, 506, 510, 652	2, 3, 3S, 5, 9,15, 35, 48, 240, 262, 503, 504, 505, 506, 510, 652
Pyrola dentata	(toothed wintergreen)	47	No unit (27 feet from unit 47)

The following briefly summarizes the habitat and distribution of the Threatened, Endangered, or Sensitive (TES) plant species with occupied habitat within the footprint of the proposed Briggs Valley Project. Definitions for species rankings can be found at: http://www.natureserve.org .

***Iliamna lactibracteata* (California globe mallow)**

The Forest Service sensitive plant *Iliamna lactibracteata* (California globe mallow) is a member of the Malvaceae (hollyhock family). The species range is from southwestern Oregon (Coos, Curry, Douglas, Jackson, and Josephine), with one widely disjunct occurrence in Linn County Oregon, to northwestern California (Del Norte, Humboldt, Siskiyou, and Trinity Counties). *Iliamna* occurs in burned white fir and Douglas-fir forests.

California globe mallow is ranked G3 globally: vulnerable-at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors; ranked by Oregon as a S2, imperiled-imperiled in the because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state; and Oregon Biodiversity Information Center, list 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders.

Iliamna latibracteata is classified as a Forest Special Status Species in both Regions 5 and 6. In Oregon, the species has been documented in the Rogue River-Siskiyou, Umpqua, and Winema National Forests. In California, the species has been documented in the Six Rivers and Shasta-Trinity National Forests (CNDDB 2007). *Iliamna latibracteata* is classified as a Sensitive Species by the Bureau of Land Management. It has been documented in the Coos Bay and Medford Districts, and is suspected to occur in the Roseburg District.

California globe mallow is an herbaceous perennial that grows from a woody root caudex. The stems are erect and branched growing to a height of 10-20 dm with finely stellate hairs. The deeply palmate 5-7 lobed leaves are 8-20 cm long, with a 5-14 cm long petiole, and slender stipules. The leaves have stellate hairs and are truncate to cordate at the base. There are generally many flowers, with 1-3 in upper axils, 2.5-6 cm long with 2-3cm long rose-purple colored to white to rose-purple petals in color. The stigmas are head-like. There are generally 10-15 fruit segments that are 6-10 mm long with 2-3 purberulent seeds per segment.

The species is hermaphroditic and vegetative reproduction is not known to occur. Sexual maturity appears to occur at approximately 3-4 years. Flowers appear in July, and produces seed in August. Individuals are most observable and identifiable during this blooming period. Fruits typically produce 20-25 mature seeds, with numerous unfertilized ovules. Seed viability levels in the species are unknown. Dispersal mechanisms are unknown, and the fruits dehisce while still attached to the plant. It is quite possible that most seeds fall to the ground directly beneath the adult plant.

Historical and extant records of occurrences suggest that *Iliamna latibracteata* may occur in metapopulations, with a large number of known occurrences concentrated in several isolated regions. The species' distribution appears to consist of widely separated sites with clusters of subpopulations. This suggests that the species may consist of several metapopulations with a limited connectivity. Metapopulations consist of a group of interconnected subpopulations. These subpopulations are spatially and/or temporally separated, resulting in lower levels of gene flow between metapopulations.

It is an early seral species with high reproductive rates, and occurs in the types of unstable and changing habitats that follow both cooler understory fires and hotter stand replacing fires. The species is likely to resprout after fire as in other *Iliamna* species (Edwards 1995, Schwegman 1990, and Stickney 1985, 1986; cited in Baskin and Baskin 1997). *Iliamna latibracteata* is a fire adapted species which responds to increased light exposure, decreased competition, and nutrient availability, as well as seed germination requirements of heat and/or smoke.

Fire suppression may be a cause for the decreased distribution and abundance of the species across its range. Increases in numbers of individuals following fire appear to be short lived and decline as shrubs and trees establish in burned areas after fire.

The species is nearly entirely restricted to lands managed by the USFS and BLM. The two agencies' emphasis on fuels reduction and returning wildlands to natural fire regimes may benefit the species, provided that post-fire salvage logging, revegetation, and invasive species management does not negatively impact occurrences. The majority of occurrences are known from USFS Region 6. Therefore the species is strongly dependent on Region 6 management and conservation efforts.

Iliamna latibracteata has a positive response to increasing light exposure in dense canopies. However, removal of too much canopy closure may result in too much light exposure and negative effects. The amount of optimum canopy removal is site specific and dependent on soil, elevation, aspect, and other variables. Timber harvest and ground disturbing activities could reduce survival ship and seed production of mature plants. Landings and skid trails should be located away from California globe mallow populations.

***Sophora leachiana* (western sophora)**

Sophora leachiana (western sophora) is a member of the Fabaceae family (pea family). It is typically found on slopes in open mixed evergreen/hardwood forest from 500 to 4,500 feet elevation.

Sophora is ranked globally as a G2, imperiled-at high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.; Oregon ranking is S2, imperiled-imperiled in the because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state; and the Oregon Biodiversity Information Center ranking as List 1, taxa that are threatened with extinction or presumed to be extinct throughout their entire range or any taxa with heritage Global ranks of G1 or G2.

Sophora is classified as a Forest Service sensitive plant species in Regions 6. The species is nearly entirely restricted to lands managed by the USFS and BLM. Found only in Oregon, the species has been documented in the Rogue River-Siskiyou National Forest. Sophora is endemic to the Siskiyou Mountains, in Josephine County, Oregon. This is the only species of this genus in the pacific states.

Sophora plants are 30-40 cm tall with numerous campanulate flowers and compound leaves. The compound leaves are 10-20 cm long and somewhat crowded near plant apex. The leaflets are oblong, rounded at both ends and 1-2 cm long. Leaflets are thin villous-tomentose and paler beneath and thinly pubescent above. The stems mostly arise singly from elongated rootstock and are usually branched and are finely grayish tomentose. The plant flowers from April to June. It has a solitary inflorescence and a 7-15 cm long terminal raceme with numerous campanulate flower having greenish-white petals. The fruit a several seeded strongly curved pod with constrictions between seeds that are densely tomentose and silvery.

Although this species is a vigorous vegetative colonizer of disturbed sites, it produces very few viable seeds, and so is unlikely to spread beyond the small area it now occupies. The vegetatively reproducing colonies are particularly vulnerable to herbicides and to physical disturbance during logging or construction activities.

The entire range is the Taylor, Briggs and Galice Creek drainages between the Rogue River and the Illinois River, in an area about 20 miles by 6 miles, occurring in openings of mixed conifer forest at low elevation. The openings include natural habitat, such as river terraces, open ridges, open rocky slopes, or meadow edges, and created openings such as roadsides and bare soil within clearcuts. Sophora acts as a primary colonizer, is dependent on disturbances to create the open sites, and possibly fire for seed scarification. The combination of having large seed, indehiscent pods, and limited seed production is extremely unusual for a pioneer species. When the tree canopy becomes re-established, sophora may persist vegetatively as rhizomes and aerial shoots, but it ceases to flower. Mature fruit have been rarely been found anywhere; the sites where seed has been observed are areas disturbed between 3-5 years prior (Kagan 1991). Wildland fire suppression is listed as one of three main factors impacting sophora populations in the Oregon Natural Heritage Draft Species Management Guide. "Selected populations" should be managed with prescribed fire to maintain the required open habitat. It is not known how long Sophora rhizomes and plants can survive in a forest without some type of fire or disturbance event. It is clear that the species does require disturbance and an open, sunny habitat for reproduction and long term survival.

***Cypripedium fasciculatum* (clustered lady's slipper)**

The Region 5 and 6 Forest Service sensitive plant species *Cypripedium fasciculatum* (clustered lady's slipper) is a member of the Orchidaceae family. The native to Western North America is found from northern California to Washington, and in the mountains of Idaho, Montana, Wyoming, Utah, and Colorado.

Clustered lady's slipper has a Global ranking of G4, apparently secure, uncommon but not rare; some cause for long-term concern due to declines or other factors, the species' large overall range and the number of known populations suggest that the taxon is not in

immediate danger. However, the small size of most populations, their isolated nature, and the presence of conflicting land uses warrant concern for the species' long-term survival throughout its range (Nature Serve Explorer 2011). Oregon state ranking is S2, imperiled-imperiled in the because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state. Oregon Biodiversity Information Center ranks the species on List 2, contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders.

This orchid is a long lived perennial which survives up to 30 years (Harrod 1994b, cited in Seevers 1998) and perhaps lives as long as 95 years (Niehaus 1974, cited in Seevers 1998). The stems are up to 2 dm tall usually with a bract near ground level and a pair of opposite leaves at the midlength or above. There are often 1 or 2 lanceolate bracts near the inflorescence. The 2 broad sessile elliptical leaves can span up to 30 cm. The flowers are 4.5 cm long and there can be up to 2-10 flowers at the end of the stem in a tight cluster with greenish bracts just below. The sepals are greenish brown or greenish purple with purple mottling or lines. The lower pair is fused completely or free at the tips. The petals are similar to the sepals but broader, ovoid, depressed and shorter than the sepals. The petals are greenish yellow with brownish purple margins sometimes with a purplish tinge. (Hitchcock *et al.,* 1969) The species has shallow a rhizomes that produces a dormant bud that bolts the following growing season. Dust like seeds requires a fungal partner for seed germination and development. It may take up to 3 years for seeds to develop into mature plants. The association of clustered lady's slipper and fungi factors may influence its distribution. Factors may include how the upper organic layer of the soil profile influences mycorrhizal fungi.

In Southern Oregon the species usually occurs in high canopy cover of late seral species including *Pseudotsuga menziesii* (Douglas fir), *Arbutus menziesii* (madrone), *Quercus kelloggii* (black oak), *Quercus chrysolepis* (canyon live oak), and *Lithocarpus densiflorus* (tanoak) (Thorpe et. al. 2010)

Threats to this species include timber harvest, road construction, trail construction, creation of recreation sites, and fire. Actions that alter the hydrology, moisture, temperature regimes, soil and litter layers, or decrease the vegetation canopy may threaten the species.

***Pyrola dentata* (toothed wintergreen)**

Pyrola dentata (toothed wintergreen) is a member of the Ericaceae family (heath family). It ranges from Montana and British Columbia to central California and Nevada". The online Jepson eFlora range is from southwest British Columbia to Baja Mexico. It can be found in mixed conifer forests, conifer and oak woodlands, pine woodlands, serpentine or volcanic forests, decomposing granitic hills, and sandy or gravelly substrates close to rock outcrops.

It is ranked globally as a G4 apparently secure, uncommon but not rare; some cause for long-term concern due to declines or other factors. Oregon State ranks the species as a S2? imperiled-imperiled in the nation or state/province because of rarity due to very restricted

range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state (however this ranking is uncertain or inexact denoted by the ?) ; and the Oregon Biodiversity Information Center as a List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders.

The perennial *Pyrola dentata* has glaucous entire or serrate leaves that can be ovate, round or elliptical measuring from 3 to 13 centimeters in length. The inflorescence measures form 8 to 27 centimeters high. There are 1 to 20 flowers on each scape with 4 to 8 millimeter white to yellow petals. The bilateral flowers have sepals that measure 1.1 to 2.3 millimeters long. Described in 1814 as part of the *Pyrola picta* (white veined wintergreen) complex. Variations in chlorophyll content and leaf morphology separate the four species within the *p. picta* complex. The species is believed to be mycoheterotrophic receiving nutrients from mycorrhiza in the soil as well as photosynthesis.

There is some discrepancy on the *Pyrola picta* complex and whether *P. dentata* is a species or just a variant of *P. picta*. The species is not recognized by the Integrated Taxonomic Information System (ITIS) or Nature Serve and categorized as a synonym of *P. picta*. However it is recognized by the online Jepson Manual and the Forest Service's Region 6. The species is found in many different habitats and elevations on the Wild Rivers Ranger District. It is found on serpentine substrates and non-serpentine substrates. In some locations the individuals of *P. dentata* are found in close proximity to individuals of *P. picta*. Individuals have been documented surviving after wildland fire and prescribed burning in different locations on the Wild Rivers Ranger District.

VI. FIELD RECONNAISSANCE:

Botanical surveys conducted in proposed project areas focus on species with potential habitat; however, surveys are floristic in nature and attempts are made to identify all species encountered in the field. Many species have specific habitat preferences (such as wet meadows, fens, granite scree), and botanists search for these as well as their constituent species.

Intuitive controlled sensitve botanical surveys were conducted during June, July, August, September, October, November, and December of 2007, 2009, 2010, 2011, 2012, 2015, 2016, and 2017 for the Upper Briggs Restoration Project area by WRRD Botanists. Intuitive controlled survey is the recommended survey method. This is when the surveyor has given the area a closer look by conducting a complete reconnaissance through a specific area of the project area and perimeter, or walking more than once through the area. As in this case, most of the project area is examined. Survey results can be found at the RRSNF Botany database files and RRSNF GIS corporate library.

There are occurences of clustered lady's-slippers, California globe-mallow, toothed wintergreen, and western sophora within the project footprint. These occurrences were previously known from the project footprint or were found during project surveys.

VII. DETERMINATION OF EFFECTS OF THE PROPOSED PROJECT

An effects analysis is required in cases where sensitive plants have been found within or near proposed project areas and/or when there is potential habitat for sensitive species and surveys *have not been conducted* in the intensity that is commensurate with the risk to species suspected in the project area.

Table 4. Past Forest Service Actions in the planning area (rounded to nearest acre, detailed acreage for vegetation management activities are in table 5).

Action	Decade	Acres/Miles/Permits	Description/Extent of Activity
Animal Control Reforestation	1990s	397 acres	The use of fencing, tubing, bud caps, seed caps, repellents, trapping, killing, or otherwise controlling animals so as to protect or enhance the growth of established forest vegetation not past the sapling stage. 10 separate units were treated.
Burning of Piled materials	2000-2008 2009-2015 **total**	29 acres 799 acres **828 acres**	A method used to reduce logging debris post-harvest that involves either machine or hand-piling material and burning the piles. 17 different areas were treated.
Commercial Thin	1990s	39 acres	An intermediate harvest with the objective of reducing stand density primarily to improve growth, enhance forest health, and other resource objectives.
Final Removal	1970s 1980s **total**	36 acres 860 acres **897 acres**	Removal of overstory after the establishment of a new cohort.
Hazardous fuels thinning	2010s	1520 acres	Thinning dense stands, removing underbrush mechanically or manually.
Invasive plant treatment	1990s	268 acres	Manual and mechanical treatment of invasive plants, include pulling, cutting and digging.
Overstory Removal Cut	1990-2000s	31 acres	The cutting of trees constituting an upper canopy layer to release understory trees. The primary source of regeneration is advanced reproduction.
Partial Removal	1960-1969 1970-1979 1973-1989 **total**	115 acres 608 acres 115 acres **837 acres**	removal of only part of a stand for purposes other than regenerating a new age class, synonym selective cutting
Piling/chipping of fuels and rearrangement of fuels	2010-2015 Unknown **total**	721 acres 28 acres **157 acres**	Hand-piling and machine-piling of woody debris for fuel load reduction. Rearrangement and redistribution of Debris resulting from natural or human activities. 20 separate units were treated.
Plant trees	1990s	392 acres	The establishment or re-establishment of forest cover artificially by planting seedlings and/or cuttings with or without site preparation. 12 areas were planted.
Plantation Thinning	2009-2015	214 acres	Thinning of trees in plantations.

Action	Decade	Acres/Miles/Permits	Description/Extent of Activity
Precommercial Thin	1990-2000	407 acres	The cutting of trees not for immediate financial return but to reduce stocking. 10 areas were thinned.
Pruning	2010s	721 acres	Raise canopy height and discourage crown fire. 23 instances of this action occurred.
Recreation and Trails	Past & Ongoing	19 miles of trail 250 acres are used for general recreation use 25 acres thinned in recreation sites	Establishment of trails and campgrounds. The primary dispersed recreation activities within the planning area include: hiking, vehicle camping, viewing scenery, hunting, berry picking, mushroom picking, and off-highway vehicle use. These uses overlap with the roads system.
Roads system management Road Vegetation reduction	Past & Ongoing **total** 2010	17.2 miles of ML1 road 86.5 miles of ML2 road 8.1 miles of ML3 road 9.1 miles of ML4 road **120.9 miles** 92 acres	Ongoing maintenance of various surfaces of road system in the watershed.
Salvage cut (intermediate treatment, not regeneration)	1960-1969 1970-1979 1980s 1990s **total**	22 acres 163 acres 67 acres 168 acres **421 acres**	Cutting made to remove injured or killed trees following a natural disturbance. 26 cases.
Shelterwood removal	1970s 1980s **total**	235 acre 13 acres **248 acres**	A type of cut that removes trees except those needed for the purpose of seed production. Prepares the seed bed and creates a new age class in a moderated microenvironment.
Stand clearcut	1959 1960-1969 1970-1979 1980-1989 1990s **total**	327 acres 533 acres 324 acres 540 acres 285 acres **2,008 acres**	An even-aged regeneration or harvest method that removes all trees in the stand producing a fully exposed microclimate for the development of a new age class in one entry. 67 instances of this action occurred.
Seed cut	1990s	69 acres	Similar to shelterwood removal. A type of cut that removes trees except those needed for the purpose of seed production.
Special Use Permits	1900-2011	Unspecified acres/ 43 permits	43 of the permits were issued for recreational events. 4 were issued for non-commercial group use. 2 were issued under an uncategorized use. 2 were issued for water transmission or irrigation ditches. 1 for a forest land management and policy permit. 1 was issued for a concession campground. The most recent permit expired in 2011.
Tree Release	1990s 2000s **total**	260 acres (39 acres were treated twice) 395 acres **655 acres**	Tree release involves the cutting of trees in young plantations to release the trees from competition and thinning around healthy trees to promote health and vigor of remaining trees.
Thinning	1970-1979 1990-2000 **total**	7.6 acres 2.9 acres **10.5 acres**	The cutting of trees not for immediate financial return but to reduce stocking. 10 areas were thinned.

Action	Decade	Acres/Miles/Permits	Description/Extent of Activity
Wildlife habitat pre-commercial thinning	1990s	10 acres	Activities where the primary focus was to enhance various habitat conditions for wildlife species. 3 separate areas were treated.
Wildfire	1939 1949 1957 1958 2002 2010 2014	Unnamed fire, 6/ 6 acres Unnamed fire. 44/ 44 acres Unnamed fire, 13/ 13 acres Unnamed fire, 8/ 8 acres Biscuit fire, 287/ 499,945 acres Oak Flats Fire, 6,415/ 7,494 acres Onion Mountain Fire, 1,338/ 4,106 acres	Some fires were started by lightening or were arson starts. The overall size of the fires may have extended outside the planning area; fire acres are reported as acres within planning area/ total fire acres.

Table 5. Total acres of past vegetation management in the planning area.

	Clearcut	Salvage	Shelterwood	Thin	Partial Removal	Overstory Removal	Final Removal	Seed Cut
1950 - 1959	326.6	0	0	0	0	0	0	0
1960-1969	532.7	22.1	0.0	0	114.9	0.0	0	0
1970-1979	323.9	163.0	234.7	7.6	607.6	0.0	36.2	0.0
1980-1989	539.5	67.2	12.6	0.0	114.7	0.0	860.4	0.0
1990-2000	284.8	168.2	0.0	2.9	0.0	30.7	0.0	69.0
total	**2007.5**	**420.5**	**247.3**	**10.5**	**837.3**	**30.7**	**896.7**	**69.0**

Table 6. Current/Ongoing and Reasonably Foreseeable FS Activities in the planning area.

Activity Type	Acres/Miles/Permits	Description/Extent of Activity
Minerals	89 active placer claims along streams in the Upper Briggs Planning area	An active claim is a mining claim that the paper work is up to date on making it a valid mining claim, doesn't mean that someone is active mining it. The Upper Briggs area is a hot spot for small type mining, panning, sluicing, and suction dredging-since this area is not closed to suction dredging per the state of Oregon. Patrol has not found a big enough operation to considerate it a substantial disturbance (if an operation is big enough, this is the point that patroller asks a miner to stop their activity and to submit a Plan of Operation to the FS).
Recreation	*See Roads System	Decommissioned roads may lead to a shift in dispersed recreation and camping sites within the project planning area.
Roads system	Maintenance and Decommissioning of 10.93 miles of ML1 road Downgrade 1.54 miles of road to ML1	Ongoing road maintenance. Some roads will be decommissioned and closed from further use as per the MVUM.
Tree plantings	121 acres	The establishment or re-establishment of forest cover artificially by planting seedlings and/or cuttings with or without site preparation.

Table 7. Past, present, and reasonably foreseeable non-Forest Service actions in the planning area.

Ownership	Past/Present/Future Actions
Private land holdings	**Past:** There 11 tax lots owned by 5 private entities within the planning area. 4 of these holdings are owned by limited corporation holdings. The corporations are likely forest product companies. One is the old Bar Mine a private in holding, which is a patented placer mine owned by a private landowner. The landowner has a wash plant and heavy equipment. Approximately 1.2 miles of roads are in place on private land holdings. **Current/Future:** The placer mine has not operated for several years. It is reasonable to infer that current actions and road use occurring on private lands will continue.

No Action Alternative

Direct Effect: Alternative 1 calls for "No Action" within the project footprint. There will be no implementation or activities within the project area therefore there will be no direct effects to sensitive species resulting from this alternative.

Indirect Effects: Sensitive species with potential habitat may experience indirect effects from Alternative 1.

Indirect Effects may occur as a result of "No Action" alternative within the proposed project area. There may be an increase in fuel loading across the landscape. This will be facilitated by a natural progression over time including increased growth of trees, additional dead trees, additional dead and downed fuels, and an increase of ladder fuels. There may be an increase of conifer encroachment into meadows and riparian ecosystems. The potential increase in tree and shrub density across the landscape may decrease available water for riparian plant species. Sensitive plants found within riparian and mesic meadow ecosystems may be impacted through habitat loss resulting from decreased soil moisture. The increased fuel loading and overstory growth will add to a shading of understory layers. This will alter the plant communities and structure. There may also be an increase in growth and density of the existing shrub layer across the landscape. All these combined factors can result in the loss of potential habitat for all listed sensitive species with suitable habitat within the project area by decreasing the amount of available suitable acreage especially species dependent on disturbance and open overstories. This may occur in forest, meadow, riparian, and shrub dominated areas.

Another indirect effect of the "No Action" alternative can be an increase in the risk to wildland fire and extreme fire behavior across the landscape. This is due to the excessive fuel loading that exists presently within the project area in addition to an estimated projected increase in fuel loading. If a wildland fire occurs then there may be adverse impacts to sensitive plant occurrences, suitable habitat, sensitive plant communities, and mycorrhizae dependent communities. This potential impact may result as a loss of suitable habitat, loss of occupied habitat, loss of individuals, and the introduction and spread of invasive plants and noxious weeds.

Sensitive plant occurrences and suitable habitat may be impacted by burning individuals or modifying suitable habitat into unsuitable habitat. Mycorrhizal mats existing in organic soils may be compromised impacting fungi and clustered lady's slippers habitat which are

dependent on organic soils containing healthy mycorrhizae. However, California globe-mallow is dependent on fire to prompt its seed bank to germinate, fire may have a positive effect upon the species creating new habitat and allowing seed banks to colonize new areas. It is not known to what degree or level of fire intensity will be beneficial or detrimental to the species. The no action alternative may be beneficial to the species providing wildland fire intensity is not too extreme as to eliminate seed banks, individuals and render habitat as unsuitable. Sophora is also dependent on disturbance to colonize areas and the no action alternative may be beneficial to the species if there is a fire providing the fire intensity is not too extreme for the species.

The disturbance that wildland fire can create opens pathways and vectors for new noxious weed and invasive plant invasions and a spread of existing infestations. Noxious weed invasion can result in negative impacts to all ecosystems, although different habitats may be invaded by different noxious weed species. Noxious weed and invasive plant infestations can lead to changes in habitat characteristics that are detrimental to sensitive species. Once weeds have become established they can indirectly impact sensitive species through allelopathy (the production and release of chemical compounds that inhibit the growth of other plants), altering fire regimes, and competing for nutrients, light, and water. Because noxious weeds can be difficult to control or eradicate, weed control efforts that must be conducted on a regular basis, such as hand-pulling or digging, could also negatively impact sensitive plants and suitable habitat.

Cumulative Effects: Past, present, and future actions may have a negative effect on sensitive plant populations and habitat. Impacts from wildland fires or invading noxious weeds can be compounded when plants are already at risk from such activities as changing hydrologic regimes, impacts from miners, trampling by recreationists, or sedimentation buildup from eroding landscapes. See discussion for individual species under Action Alternatives.

The following provides a discussion of the direct, indirect, and cumulative effects of the project on the sensitive species identified with known populations in the project area for the <u>two action alternatives</u>:

Action Alternatives

Proposed Action and Alternative 2 (Proposed Action)

The direct and indirect effects of project activities on the botanical resources are described first followed by species specific effects.

DIRECT EFFECTS

Direct effects occur when sensitive plants or their potential habitat are physically impacted by activities associated with the proposed action. Direct impacts from the proposed project activities may include: physically breaking, crushing, or uprooting sensitive plants by felling of trees or trampling, covering them with slash, prescribed fire treatments, and compromising suitable sensitive plant habitat. Individuals may be displaced in other ways including changing the hydrology to sensitive plant communities.

Direct effects from fuel reduction and thinning of trees
No direct impacts are expected to occurrences of clustered lady's-slippers and California globe-mallow. Design features require that all populations will be buffered, flagged, and avoided. Project activities (except for underburning) will not occur within the buffered areas. Western sophora may receive direct impacts from thinning of trees. Individual plants may be killed, crushed, and disturbed from tree thinning operations.

Impacts to suitable sensitive plant habitat include: crushing, killing, or injuring herbaceous and non-vascular plants (which can reduce growth or seed production); felling and removing overstory trees; reducing the canopy cover and understory shading; reducing stand tree density; removing or killing understory shrubs reducing the shrub cover; removal of coarse woody debris; accumulation of slash and wood chips dispersed on the ground; the creation of wood piles; reduction of the ground litter layer; ground disturbance; soil disturbance; soil compaction; and the creation of disturbed areas.

Direct effects from underburning
Direct effects are not expected to occur in occurrences of clustered lady's-slippers or toothed wintergreen from underburning. All occurrences will be buffered, flagged, and avoided. Direct effects are expected to occur in the one occurrence of California globe-mallow and western sophora occurrences. Underburning will be allowed in these sensitive plant species occurrences. Effects from underburning may include consuming, burning, or charring with fire above ground plants materials and burning below ground plant structure.

These two species are disturbance loving. Although there may be an initial negative impact to the existing individuals there will be a long term beneficial effect to the populations. California globe-mallow needs fire to germinate seed that are in the seedbank. Without fire this occurrence is at risk to be unable to germinate seeds to produce new individuals and may in time be extirpated. Fire will create habitat disturbance that is necessary to promote western sophora populations.

Direct effects from the construction of landing and temporary roads
No direct impacts are expected to occurrences of clustered lady's-slippers, California globe-mallow, toothed wintergreen, and western sophora. Design features require that all populations will be avoided.

Impacts to suitable sensitive plant habitat include: crushing, killing, or injuring herbaceous and non-vascular plants (which can reduce growth or seed production); felling and removing overstory trees; reducing the canopy cover and understory shading; reducing stand tree density; removing or killing understory shrubs reducing the shrub cover; removal of coarse woody debris; accumulation of slash and wood chips dispersed on the ground; the creation of wood piles; reduction of the ground litter layer; ground disturbance; soil disturbance; soil compaction; and the creation of disturbed areas.

Direct Effects from the decommissioning of system roads
No direct impacts are expected to occurrences of clustered lady's-slippers, California globe-mallow, toothed wintergreen, and western sophora. Design features require that all populations will be avoided. Impacts to suitable sensitive plant habitat include: crushing, killing, or injuring native plants; soil and ground disturbance; and the creation of disturbed areas.

INDIRECT EFFECTS
Indirect effects on sensitive species or their potential habitat are effects that are separated from an action in either time or space. Indirect effects resulting from project implementation may affect the quantity, quality, and distribution of habitats and may have positive or negative effects on sensitive plant, lichen, bryophyte, and fungi populations. These effects, which can be beneficial or detrimental to sensitive species, may include: changes in vegetation composition; changing local hydrologic patterns or soil characteristics in sensitive species habitats; noxious weed invasions; fire treatment response; and impacts to mycorrhizae associated with sensitive plant species.

Indirect effects from fuel reduction and thinning of trees
Indirect effects within suitable sensitive plant habitat include altering plant communities, changing vegetation composition and successional pathways, impacts to soils and mycorrhizal soils of sensitive plants, and the potential for noxious weed invasion or spread. Suitable habitat may be directly altered initially however there may be long term beneficial indirect effects from the proposed project.

The proposed project may enhance and increase available sensitive plant suitable habitat by changing the present condition to a more desirable condition. This may include an increase of available water to soils and riparian areas and the reduction of canopy cover of trees and shrubs.

The proposed project will reduce undesirable conifer densities into select project area through thinning of trees followed up with prescribed fire. By decreasing the stand densities and opening up the canopy by reducing the percent cover sensitive plant communities will have the opportunity to increase individuals and the health of western sophora and California globe-mallow populations.

Years of fire suppression and the lack of fuel treatments within the proposed project area have increased the fuel loading across sections of the project area landscape to an undesirable level. The proposed project will reduce the risk of extreme wildland fire behavior through decreasing the fuel loading and reducing fuels within the project area.

Indirect effects from prescribed fire and underburning
Indirect effects within suitable sensitive plant habitat include altering plant communities, changing vegetation composition and successional pathways, negative impacts to soils and mycorrhizal soils of sensitive plants, and the potential for noxious weed invasion or spread.

Suitable habitat may be directly altered initially however there may be long term beneficial indirect effects from the proposed project. The proposed project may enhance and increase available sensitive plant suitable habitat by changing the present condition to a more desirable condition. Undesirable stand densities and canopy closure for western sophora and California globe-mallow will be reduced in through implementation, thinning and underburning.

The proposed project, in addition, would reduce the risk of stand replacing wildland fire through decreasing the fuel loading within the project area.

Indirect effects from the construction of landing and temporary roads
Indirect effects within suitable sensitive plant habitat include altering plant communities, changing vegetation composition and successional pathways, impacts to soils and mycorrhizal soils of sensitive plants, and the potential for noxious weed invasion or spread. Suitable habitat may be directly altered initially however there may be long term beneficial indirect effects from the proposed project.

Indirect effects from the decommissioning of roads
Indirect effects within suitable sensitive plant habitat include altering plant communities, changing vegetation composition and successional pathways, impacts to soils and mycorrhizal soils of sensitive plants, and the potential for noxious weed invasion or spread. Suitable habitat may be directly altered initially however there may be long term beneficial indirect effects from the proposed project. By eliminating road prisms within the project area additional habitat could be available for native plant communities.

Indirect effects to wetlands, meadows, springs, and riparian areas
Indirect effects within suitable sensitive plant habitat include altering hydrology, flow patterns, and water regimes which affect sensitive plants, potential habitat, and sensitive plant communities. Reducing the overstory through fuel reduction and thinning also creates openings with less shading which can promote more evaporation of wetlands reducing water levels early in the growing season.

Beneficial indirect effects to wetlands, meadows, springs, and riparian areas can result from fuel reduction and thinning which may enhance and increase suitable sensitive plant habitat and desirable riparian plant communities. Removing trees reduces the evapotranspiration rates around wetlands, wet meadows, springs, and riparian areas which can increase available ground and runoff water to the ecosystems.

Indirect effects to mycorrhizal soils associated with sensitive plant species within suitable sensitive plant habitat
Factors that regulate the health and productivity of forests include organic soils. Fuels reduction and tree thinning, prescribed burning, and wildfires can produce negative impacts which reduce the amount of soil surface organic matter. This potentially could reduce the mycorrhizae development altering both the growth of trees, plants, and fungi depending on this organic soil component. Several factors such as conifer thinning, fuels reduction, fire

severity and burn timing will influence the type and degree of negative impacts to mycorrhizal soils.

Mycorrhizae connect soils systems and plants that affect plant nutrition, nutrient cycling, and soil structure. Studies have correlated the removal of organic soil horizons and high levels of soil disturbance to tree growth and mycorrhizae reduction. The impacts on soil health and productivity from the removal of large coarse woody debris through fuels reduction and thinning are unknown (Jurgensen, Harvey, et al 1997).

Fire effects on ecosystems can range from the elimination or reduction of above ground plant parts to impacts to below ground plant structures and processes. Fire can produce either beneficial or negative effects to the ecosystem depending on the fire severity. Burning slash and fuel piles of harvested wood can regenerate fewer understory plant species than in unburned areas. Burning can also promote the growth of noxious weeds by creating disturbed areas and releasing unexpressed noxious weed seed banks.

Clustered lady's-slippers are dependent on soil mycorrhizae for establishment and growth. Reduction in mycorrhizae associated soils from high burn severity can cause negative indirect effects and the loss of potential habitat. The mycoheterotrophic toothed wintergreen is believed to receive nutrients from mycorrhiza in the soil as well as photosynthesis. Impacting the mycorrhiza may cause harm to individual's vigor and viability.

Indirect effects from invasive plants

Indirect effects include impacts on sensitive plant species and their habitats by potential noxious weed invasions and changes in vegetation structure as a result of project implementation. There are noxious weeds known from within the project area, there is a potential for spread of existing infestations by releasing existing seed banks and also the introduction of new noxious weed seeds within the project area from project implementation.

Noxious weed invasion can result in negative impacts to all ecosystems, although different habitats may be invaded by different noxious weed species. Noxious weed infestations can lead to changes in habitat characteristics that are detrimental to sensitive plant species. Once weeds have become established they can indirectly impact sensitive species through allelopathy (the production and release of chemical compounds that inhibit the growth of other plants), altering fire regimes, and competing for nutrients, light, and water. Noxious weeds can cause indirect effects by reducing sensitive and native plant habitat and altering existing sensitive and native plant communities. Because noxious weeds can be difficult to control or eradicate, weed control efforts that must be conducted on a regular basis, such as hand-pulling or digging, could also negatively impact sensitive plants.

If standard management requirements such as: inventory; avoiding noxious weed areas; using clean weed free equipment and vehicles; using weed free material; and avoiding spread are utilized; the threat from noxious weed establishment and infestation will be greatly minimized (see Upper Briggs Restoration Project Invasive Plant Risk Assessment).

SPECIES SPECIFIC EFFECTS
Sensitive species that were not located during project surveys would have no negative direct, indirect, or cumulative effects. This includes reduction of fuels, thinning of trees, temporary road or landing construction, or prescribed fire and underburning. The following species will not be analyzed further.

Vascular Plants
Adiantum jordanii (California Maiden-hair), Allium peninsulare (peninsular onion), Cheilanthes covillei (Coville's lip-fern), *Cryptantha simulans* (pine woods cryptantha), *Ericameria arborescens* (golden fleece), *Keckelia lemmonii* (bush beardtongue), *Lotus stipularis* (stipuled trefoil), *Pellea andromedifolia (coffee fern), Pellea mucronata ssp. californica (birds-foot fern), Rhamnus ilicifolia* (redberry), *Solanum parishii* (Parish's horse-nettle)

Bryophytes
Entosthodon fascicularis, Porella bolanderi

Fungi
Chamonixia caespitosa, Phaeocollybia californica, Pseudorhizina californica, Rhizopogon ellipsosporus, Rhizopogon exiguous

The following species have occurrences within the project footprint

***Cypripedium fasciculatum* (clustered lady's slipper)**
There will be no direct effects to clustered lady's slipper from the proposed project. Design features have been created to eliminate any direct effects to clustered lady's slipper from project implementation (see Section IX. Design Features, clustered lady's slipper). This includes fuels reduction, thinning of trees, prescribed fire, underburning, creation of temporary roads, the creation of landings, or the decomissioning of roads. There are seven populations of clustered lady's slipper found in units 3, 21, 22, 23A, , 63, 508, and 509 that were previously known from the project footprint or located during project surveys.

Due to years of fire suppression the natural fire regime and fire return interval across the Upper Briggs Restoration project area has been altered. This has promoted an increased fuel loading, increased tree density, and increased overstory shading. This has also provided for high percent canopy cover that is needed for clustered lady's slipper.

The proposed project may yield beneficial indirect effects to populations of clustered lady's slipper and potential habitat. Fuel reductions from thinning of trees, prescribed fire, and underburning will reduce basal area, density, and overstory shading of conifers in adjacent areas of populations. Subsequent to the initial disturbance from project implementation, long term beneficial indirect effects may occur. A healthier ecosystem may emerge after fuel treatments providing more available moisture for vegetation. Another beneficial effect from project implementation would be the decreased risk of high severity wildfires that potentially extirpate populations. However, negative indirect effects may occur if invasive plants are introduced or spread from project implementation. These non-native species may threaten

clustered lady's slippers habitat by altering the existing native plant communities, compromising mycorrhizal soils and diminishing lady slipper's habitat.

Cumulative Effects: Past, present, and foreseeable future actions may have affected or may affect clustered lady's slipper in the Upper Briggs Restoration Project area. Past, present, and foreseeable future actions are bounded where clustered lady's slipper is found in the vicinity of the proposed project area. This bounding was chosen because these populations are isolated from the other Rouge River-Siskiyou NF populations of clustered lady's slipper due to the relationship with mycorrhizal soils needed for seed germination, development, and growth the species has.

There are 115 populations of clustered lady's slipper on the Wild Rivers Ranger District alone. The species is a perennial that can propagate by sexual and asexual reproduction. Rhizomes produce buds that can create clumps of ramets that occur very close within several centimeters of each other. Sexual reproduction is the species primary mechanism for maintaining genetic diversity and expanding populations. Seeds usually fall within 2 meters of the plant however may be dispersed by overland water flow and rain splash as well as animals such as ungulates. Monitoring of populations in Oregon and California revealed that one population can range from one individual to over 1,000 (Gray et al, 2012). Half of the populations have fewer than 10 individuals and 90% of the populations have fewer than 100 individuals. Practically all the sites in Washington and Oregon have less than 100 individuals and most site less than 20. Population Viability Analysis data show that small populations with less than 10 individuals are at the greatest risk to extirpation (50% or greater) while populations with greater than 100 individuals were almost completely secure. Analysis imply that small populations with few individuals will blink out within a certain timeframe while the larger occurrences will persist into the future.

Management activities such as canopy removal and prescribed fire may alter the species habitat causing detrimental impacts to populations. If the orchid's new spring growth is damaged from frost, fire, browsing, or other reasons than the individual may not put on new growth till the following year and can possibly cause stress and extirpation of the individual.

Past and present activities may have already altered the sensitive plant habitat and occurrences. Timber harvest may have crushed or killed individuals and negatively impacted suitable habitat by altering canopy cover, native plant communities, hydrologic function, and changing habitat areas that support clustered lady's slipper. Mycorrhizal soil, which the species depends on, may have been negatively impacted through timber harvest, brush disposal, fire, and fire suppression activities. The Oak Flat Fire of 2010 burned acres in near the project footprint impacting populations of clustered lady's slipper there. Individulas were relocated after the fires disturbance. The individuals were characterized as compromised or extirpated.

Current management direction is designed to eliminate or reduce possible negative cumulative impacts by protecting known sensitive plants species from direct and indirect impacts. Because design features created would buffer and avoid the populations of clustered lady's slipper and their existing habitat, there would be no direct effects and limited negative

indirect effects to these populations from invasive plants. As a result there may be minimal negative cumulative effects to clustered lady's slipper as a result of the proposed project from invasive plants. Invasive species can cause indirect effects by reducing sensitive habitat and altering existing sensitive plant communities. Mitigations have been created to reduce the risk of weed establishment or spread (refer to Upper Briggs Restoration Invasive Risk Assessment).

***Iliamna lactibracteata* (California globe mallow)**
There will be no negative direct effects to California globe mallow from the proposed project because of design criteria that have been created (see Section IX. Design Features for California globe mallow). This includes fuels reduction, thinning of trees, prescribed fire, underburning, creation of temporary roads, or the creation of landings. There is one population of California globe mallow within the footprint of the proposed project located during project surveys. This small population exists in unit 3, 14, and 50. There could be minimal indirect effects from the proposed project if invasive plants are introduced or spread into the population location. There are invasive plants near the population along a FS road which may be used during implementation. Design features have been created to prevent or minimize the spread of invasives plants. The design features can be located in the Upper Briggs Restoration Project Invasive Species Risk Assessment.

Years of fire suppresion has altered the fire regime and fire return intervals. This in turn allowed for an increase in stand density of conifer species into the project area. This is evident from comparing previous aerial photographs taken over 50 years ago from present day aerial photographs. The additional conifers present today are limiting the population size and health of this species. California globe mallow is a early seral disturbance dependent species that needs somewhat open canopies to survive. Low to high burn severity fires are necessary for the species seeds to propagte. The optimum percent canopy cover necessary for the health of populations is site specific. Factors regulating populations vigor include slope, aspect, soil moisure, temperature, and others. The species is also dependant upon fire to germinate seeds within the populations seedbanks.

The proposed project may have very beneficial indirect effects upon the California globe mallow population and potential habitat. By eliminating conifers and other vegetation and decreasing conifer densities around the population a positive effect could be achieved. Design features for California globe mallow include excluding mechanical or skyline treatment within a 50 ft. foot buffered area surrounding the occurrence. Hand thinning around flagged individuals within the buffered areas will open up the canopy for the population by eliminating overstory. This will help increase available light exposure that is necessary for the species viability. No pile burning will be allowed within the buffer. However, lop and scatter fuels and prescribed fire will be allowed wthin the buffer enabling fire dependent seeds to germinate establishing additional individuals into the population. This will enhance the California globe mallow population and present habitat which at the present condition is at risk to becoming extirpated.

Recently habitat enhancement was performed for California globe mallow in unit 3. Shrubs and trees up to 8 inches in diameter were removed, fuel piles were constructed away from the

individuals then burned, and then underburning of the area. The habitat was opened up, however the most plants had been browsed for 2 years prior to the enhancement affecting annual above ground structures devlopement, vigour, and seed production. Project implementation would continue habitat enhancement for individuals previously treated and for individuals in unit 14 that did not receive treatment.

Cumulative Effects:
Occurrence records for California globe mallow implies that the species occurs in several metapopulations separated geographically. The isolated sites have groups of subpopulations within them. The metapopulations probably have limited connectivity and gene flow with each other. Past, present, and foreseeable future actions are bounded where California globe mallow is found in the vicinity of the proposed project area since there are no other populations in the watershed or adjacent watersheds.

Past and present activities may have already altered sensitive plant occurrences and their habitats. The exclusion of historic frequency of low intensity fire and the absence of disturbance in the area has prohibited California globe mallow to establish, maintain healthy populations, and remain in the ecosystem. Without disturbance and fire this adjunct population is at high risk of being lost.

The extent of cumulative effects to sensitive plants depends on the management of potential direct and indirect effects, as well as the attributes of the sensitive plant species located within the project area, their distribution within the project area, and the ability to design future projects with sensitive plant attributes in mind. Current management direction is designed to eliminate or reduce possible negative cumulative impacts by protecting known sensitive plants species from direct and indirect impacts. Project design features created would avoid negative direct impacts to California globe mallow while producing positive indirect effects to the species, existing habitat, and potential habitat. Removal of trees will create a positive response to the species by increasing light exposure. Fire would allow seed banks to germinate and benefit the species. However there would be minimal negative indirect effects from the risk of invasive plants. There would be no negative direct and minimal indirect effects to California globe mallow. Therefore, would be minimal cumulative effects to California globe mallow as a result of the proposed Upper Briggs Restoration Project due to the risk of invasive species establishment and spread. Noxious weeds can cause cumulative effects by reducing sensitive plant habitat and altering existing sensitive plant communities. Mitigations have been created to reduce the risk of weed establishment or spread (refer to Upper Briggs Restoration Invasive Risk Assessment). There will be positive cumulative effects to the occurrence by enhancing and extending potential habitat while providing the methods that are needed to increase individuals within the population.

***Sophora leachiana* (western sophora)**
There will be limited negative direct or negative indirect effects to western sophora from the proposed project because of design criteria that have been created (see Section IX. Design Features for western sophora). This includes fuels reduction, thinning of trees, prescribed fire, and underburning.

There is an extensive occurrence of western sophora within the footprint of the proposed project located during project surveys. Populations are found in units 2, 3, 3S, 5, 9, 14,15, 16, 35, 48, 240, 262, 503, 504, 505, 506, 510, and 652. Populations are dispersed over many acres.

Years of fire suppresion has altered the fire regime and fire return intervals. This in turn allowed for an increase in stand density of conifer species into the project area. This is evident from comparing previous aerial photographs taken over 50 years ago from present day aerial photographs. The additional conifers present today are limiting the populations health. Western sophora is a disturbance dependent species that needs somewhat open canopies and disturbance to survive. Without natural disturbances (including fire) western sophora suitable habitat can be diminished or ultimately disappear

Individuals may receive direct impacts from crushing, burning, and killing individuals by skyline logging, felling trees, and prescribed fire. However, the projects short term direct impacts will be outweighed by the projects long-term beneficial effects. The proposed project may have very beneficial indirect effects upon the western sophora population and potential habitat. By eliminating conifers and other vegetation and decreasing conifer densities around the populations a positive effect will be realized. Design features for western sophora include excluding mechanical ground treatment within populations and around individuals. No landings or temporary roads would be constructed within populations. Treatments will provide the canopy opening and disturbance the species needs without excessive adverse effects to the populations. This will be acheived by limiting soil compaction that otherwise would occur with ground based mechanical treatments. Pile burning will be prohibited on or immediately near individuals within population areas, however, lop and scatter fuels and prescribed fire will be allowed. This would create the disturbance that is necessary for the species to regenerate and thrive enhancing the western sophora populations and it's habitat. It will also create additional potential habitat for the species in the project area. In addtion, design features recommend the creation of opening ½ to ¾ acres near individuals (not on individuals) allowing the species additional optimum habitat that potentially can be colonized.

Cumulative Effects:
Western sophora is a tight endemic rare plant that occupies a small geographic range. It has a very restricted known range. All populations are within an 11 mile radius from the project footprint and exist between the Illinois and Rouge Rivers in Josephine County, Oregon. Past, present, and foreseeable future actions are bounded where western sophora is found in the vicinity of the proposed project. This is because the endemic western sophora has a very restricted area and is not found any other locations.

Past and present activities may have already altered sensitive plant occurrences and their habitats. The exclusion of historic frequency of low intensity fire and the absence of disturbance in the area can prohibit western sophora to establish, maintain healthy populations, and remain in the ecosystem. Individuals simply persist clonally in the understory but do not produce viable seeds for regeneration and dispersal slowly decreasing in size and viability.

The extent of cumulative effects to sensitive plants depends on the management of potential direct and indirect effects, as well as the attributes of the sensitive plant species located within the project area, their distribution within the project area, and the ability to design future projects with sensitive plant attributes in mind. Current management direction is designed to eliminate or reduce possible negative cumulative impacts by protecting known sensitive plants species from direct and indirect impacts. Project design features created would limit adverse short-term direct impacts to western sophora while producing positive long-term indirect effects to the species, existing habitat, and potential habitat. There would be some negative direct effects to western sophora however, design features minimize the impacts. Beneficial indirect effects to western sophora as a result of project implementation include the reduction in canopy closure and the necessary required disturbance that is essential for maintaining the health of the species. Therefore, would be minimal short-term negative cumulative effects, including noxious weed spread as a result of the proposed Upper Briggs Restoration Project. Noxious weeds can cause cumulative effects by reducing sensitive plant habitat and altering existing sensitive plant communities; mitigations have been created to reduce the risk of weed establishment or spread (refer to Upper Briggs Restoration Invasive Risk Assessment). However, there will be many positive long-term cumulative effects to western sophora by the proposed project. Long term effects include enhancing and extending the species potential habitat while providing the methods that are needed to increase the population. Without disturbance this species is at risk of disappearing from the landscape within the proposed units.

***Pyrola dentata* (toothed wintergreen)**

There will be no negative direct effects to toothed wintergreen from the proposed project because of design criteria that have been created (see Section IX. Design Features for toothed wintergreen). This includes fuels reduction, thinning of trees, prescribed fire, underburning, creation of temporary roads, or the creation of landings. There is one population of toothed wintergreen within the footprint of the proposed project located during project surveys. This small population exists in unit 47. There could however be minimal indirect effects from the proposed project if invasive plants are introduced or spread into the population location.

Cumulative Effects: Past, present, and foreseeable future actions may have affected or may affect toothed wintergreen in the Upper Briggs Restoration Project area. The species is known form British Columbia to Baja Mexico. Toothed wintergreen has been documented on throughout the Wild Rivers Ranger District in different habitats, elevations, and soils. It has been found above on both serpentine and non-serpentine soils. The species appears to have a wide range ecosystems that it can persist on rather than specific to one niche or habitat type. Past, present, and foreseeable future actions are bounded where toothed wintergreen is found in the vicinity of the proposed project area. This bounding was chosen because these populations are isolated from the other known Rouge River-Siskiyou NF populations of toothed wintergreen.

There would be no negative direct and minimal indirect effects to toothed wintergreen. Therefore, would be minimal cumulative effects to toothed wiintergreen as a result of the proposed Upper Briggs Restoration Project due to the risk of invasive species establishment.

Invasive plants have the potential to alter associated native plant communities, diminish potential habitat, and compromise soil mycorrhiza. Mitigations have been created to reduce the risk of weed establishment or spread (refer to Upper Briggs Restoration Invasive Risk Assessment).

Sensitive Fungi

Field surveys were conducted for fungi. However, due to the unreliable above-ground presence of fruiting bodies from year to year, additional analysis is presented below. The mycelium (the non-fruiting portion of the fungus) is generally underground and remains undetected until it develops visible reproductive structures (fruiting bodies such as mushrooms, truffles, corals, puffballs, cups), or the substrate is disturbed, exposing the usually white mycelial mats (Cushman and Huff 2007). Even with above-ground fruiting bodies present, their correlation with the extent and abundance of the fungal organisms underground is unknown. Fungal colonies can range in size from microscopic to many acres and can persist for years or decades. No Sensitive fungi are known to occur within the planning area, but habitat is present. The species suspected to occur are associated with forest floor litter, down woody material, host tree/shrub species, or a combination thereof. While these associations are known, details about the requirements for forest floor litter or down woody material for most fungal species are not well understood, and host specificity is not often known beyond the broad categories of conifers, hardwoods, or plant families within these categories (Cushman and Huff 2007). Hence, for the purpose of this B.E., the entire Douglas-fir mixed hardwood vegetation type is considered habitat for each fungal species suspected to occur within the area.

Table 8. Direct and Indirect Effects to Sensitive Fungi

Activity	Potential direct effects to Sensitive fungi	Potential indirect effects to sensitive fungi
Tree Thinning using aerial and ground based methods	Potential impacts include damage to the mycelial network, damage to host plants and changes in species diversity following treatment. Degree of impact depends on the method used and spatial extent of impact.	Soil compaction typically results in reduced host root growth, reduced root tip availability for mycorrhizal fungi, and reduced organics needed by saprobic fungi. Fungal biomass decreases with decreased canopy cover and less downed woody debris. Increase in solar radiation and modification of forest floor conditions. Over the long-term resulting in reduced moisture retention and reduced likelihood of colonization by non-weedy fungi.
Broadcast burn	Low intensity fire likely only affects the upper 5 cm of litter and its inhabitants. The majority of fungal species diversity resides in the mineral soil. Potential impacts include	The more intensely a fire burns, the greater the indirect impacts to overstory shade and quantity of litter, organic matter and large woody debris. Specific

Activity	Potential direct effects to Sensitive fungi	Potential indirect effects to sensitive fungi
	damage to the mycelial network, damage to host plants and changes in species diversity following fire. Degree of impact depends on the fire intensity and spatial extent of impact.	requirements for shade, litter, organic matter and woody debris aren't known for each sensitive fungal species. High levels are probably more important to saprobic vs. mycorrhizal fungi. Loss of organics likely limits moisture retention capability for most fungal species.
Pile burning	Concentrated burning can result in high burn intensity and greater changes in fungal diversity. Direct impacts include damage to the mycelial network occurring in the litter to depths w/in the mineral soil. Because the majority of fungal diversity resides in the mineral soil, more species have the potential to be negatively affected by pile burning than broadcast burn, however effects of piles are more localized.	Loss of litter, organic matter and overstory shade will impact site, over the long-term resulting in reduced moisture retention and reduced likelihood of recolonization by non-weedy fungi. May reduce fungi species diversity.
Road, and landing construct-ion	Extent of impact typically localized. Direct impacts include damage to mycelial network, loss of host plants and loss of organic materials needed by fungi.	Soil compaction typically results in reduced host root growth, reduced root tip availability for mycorrhizal fungi, and reduced organics needed by saprobic fungi. Over the long-term resulting in reduced moisture retention and reduced likelihood of colonization by non-weedy fungi.
Machine chipping/ mastication	May damage mycelial networks.	May damage or destroy duff and substrate layers on which fungi depend. Deposition of chipped material may result in an excessive increase in organic matter potentially altering duff and substrate chemistry (Cushman and Huff 2007).

Table 8 lists the effects to Sensitive fungi within the Upper Briggs Restoration project footprint. "Potential Impacts" from the ISSSSP website found under the Conservation Planning Tools section was used a reference to determine potential effects to fungi (Interagency Special Status/Sensitive Species Program website). The "Potential Impacts" document cites primary literature which supports these effects determinations.

A number of project design criteria inherent to the proposed action will minimize the above mentioned direct and indirect impacts to sensitive fungi (if present). Chipping and mastication will occur in early to mid-seral forest stands which probably do not provide prime habitat for Sensitive fungi. Proposed thinning prescriptions retain old and large trees and promote tree and shrub species diversity. Maintaining a diverse array of host species of varying size and age classes will tend to promote fungal diversity. Additionally, acres of the planning area will be treated non-commercially and acres of the planning area will not be treated. For the most part, a portion of the non-commercial and untreated areas tend to be composed of mature forest habitat and represent the highest potential for Sensitive fungi occurrence. Thus the proposed action will retain refugia for sensitive fungi throughout the project area.

In sum, although some level of negative impacts and cumulative effects may occur to Forest Service sensitive fungal species (if present) one of the goals of the project is to promote old forest habitat (for RR & LSR, see Siskiyou National Forest Land and Resources Management Plan, 1989) and return fire as a natural agent of disturbance to the landscape. In the long-term, return of fire to the landscape may reduce the probability of a large-scale, high intensity stand replacing fire event. A large-scale, high intensity, stand-replacing fire would likely have a longer-lasting detrimental impact upon the fungal community than the proposed action.

Hence, although the proposed action **may impact individuals or habitat, it will not likely contribute to a trend towards federal listing or, cause a loss of viability to any sensitive fungal species.**

VIII. DETERMINATION

The effects determination is based on professional judgment, existing information, including the existing condition of the project area, and the potential impacts of the proposed project. The effects determination is based on an evaluation of all past and potential direct, indirect, and cumulative effects. Even if the potential direct effects are considered negligible, it is possible that the indirect or cumulative effects may affect (to some degree) the viability of the species.

It is my determination that for the proposed project Upper Briggs Restoration Project:

- There would be **no effect** to *Fritillaria gentneri* (Gentner's fritillaria), *Arabis macdonaldiana* (Maccdonald's rock cress), or *Lomatium cookii* (Cook's lomatium), or any other plant species listed as threatened, endangered, proposed for listing, or candidates under the Endangered Species Act of 1973, as amended (ESA), administered by the U.S. Fish and Wildlife Service (USFWS) from the proposed Briggs Valley Project. This determination is based on the absence of suitable habitat within the project area and the absence of individuals known or expected to occur within the project area.

- There would be **no impact** to the following Rogue River Siskiyou National Forest sensitive species; this determination is based on the absence of suitable habitat within the project area and the absence of individuals known or expected to occur within the project area**:**

  Vascular Plants

  Arabis modesta (Rogue canyon rockcress), Arctostaphylos hispidula (hairy manzanita), *Arnica viscosa* (Shasta arnica), *Asplenium septentrionale* (grass fern), *Bensoniella oregana* (bensonia), *Boechera horizontalis* (Crater Lake rockcress), *Botrychium pumicola* (pumice grapefern), *Calochortus howellii* (Howell's mariposa-lily), *Camassia howellii* (Howell's camas), *Carex capitata* (capitates sedge), *Carex comosa* (bristly sedge), *Carex diandra* (lesser panicled sedge), *Carex klamathensis.*(Klamath sedge), *Carex lasiocarpa* var. *americana* (slender sedge), *Carex nervina* (Sierra nerved sedge), *Castilleja schizotricha* (split-hair paintbrush), *Cheillanthes intertexta* (coastal lip-fern), *Chlorogalum angustifolium* (narrow-leaved amole), *Collomia mazama* (Mt. Mazama Collomia), *Corydalis aquae-gelidae* (cold-water corydalis), *Cryptantha milo-bakeri* (Milo baker's cryptantha), *Cyperus acuminatus* (short-pointed cyperus), *Delphinium nudicale* (red larkspur), *Dicentra pauciflora* (few-flowered bleeding heart), *Diplacus bolanderi* (Bolander's monkeyflower), *Diplacus congdonii* (Congdon's monkeyflower), *Draba howellii* (Howell's whitlow-grass), *Epilobium oreganum* (Oregon willow-herb), *Epilobium siskiyouense* (Siskiyou willow-herb), *Erigeron cervinus* (Siskiyou daisy), *Erigeron petrophilus* (Cliff daisy), *Erigonum lobbii* (Lobb's buckwheat), *Erythronium howellii* (Howell's adder-tongue), *Eschscholzia caespitosa* (gold poppy), *Frasera umpquaensis* (Umpqua Swertia) *Gentiana newberryi* (Newberry's gentian), *Gentiana plurisetosa* (elegant gentian), *Gentiana setigera* (Waldo gentian), *Hackelia bella*, (beautiful stickseed), *Hastingsia Bracteosa* var. *atropurpurea* (purple rush-lily), *Hastingsia Bracteosa* var. *bracteosa* (large-flowered rush-lily), *Hesperocyparis bakeri* (Baker's cypress),*Hiericium horridum* (shaggy hawkweed), *Horkelia hendersonii* (Henderson's horkelia), *Horkelia tridentata* ssp. *tridentata* (three-toothed horkelia), *Lewisia leeana* (Lee's lewisia), *Limnanthes alba* ssp. *gracilis* (slender meadow foam), *Limnanthes floccosa* ssp. *bellingeriana* (Bellinger's meadow foam), *Lomatium engelmanii* (Engelman's desert-parsley), *Lupinus aridus* var. *ashlandensis* (Mt. Ashland lupine), *Lupinus tracyi* (Tracy's lupine), *Ophioglossum pusillum* (adders-tongue), *Perideridia erythrorhiza* (red-rooted yampah), *Phacelia leonis* (Siskiyou Phacelia), *Pilularia americana* (American pillwort), *Pinus albicaulus* (Whitebark Pine), *Plagiobothyrs figuratus* ssp. *corallicarpus* (coral seeded allocarya), *Plagiobothrys greenei* (greene's popcorn flower), *Poa rhizomata* (timber bluegrass), *Polystichum californicum* (California sword-fern), *Prosartes parvifolia* (Siskiyou fairy bells), *Rafinesquia californica* (California chicory), *Rhamnus ilicifolia* (redberry), *Rhynchospora alba* (white-beaked rush), *Ribes divaricatum* var. *pubiflorum* (straggly gooseberry), *Romanzoffia thompsonii* (Thompson's mistmaiden), *Rorippa columbiae* (Columbia cress), *Saxifragopsis fragarioides,* joint-leaved saxifrage), *Scheuchzeria palustris* var. *americana* (sheuchzeria), *Schoenoplectus subterminalis* (water clubrush), *Scirpus pendulus* (drooping bulrush), *Scoliopus bigelovii* (California fetid adderstongue), *Sedum moranii* (Rogue River

stonecrop), *Sidalcea malviflora* ssp. *patula* (coast checker bloom), *Silene hookeri* ssp. *bolanderi* (Bolander's catchfly), *Streptanthus glandulosus* (common jewelflower), *Streptanthus howellii* (Howell's streptanthus), *Tauschia howellii* (Howell's tauschia), *Tetrapteron graciliflorum* (slender-flowered evening-primrose), *Trillium kurabayashii* (Sisikiyou trillium), *Utricularia minor* (lesser bladderwort), *Viola primulifolia* ssp. *occidentalis* (western bog violet), *Wolffia columbiana* (Columbia water-meal), *Zigadenus fontanus* (small-flowered death camas)

Bryophytes
Anastrophyllum minutum, Andreaea schofieldian, Bryum calobryoides, Calypogeia sphagnicola, Cephaloziella spinigera, Cryptomitrium tenerum, Encalyptra brevicollis, Encalyptra brevipes, Harpanthus flotovianus, Kurzia makinoana, Lophozia gillmanii, Orthodontium gracile, Orthodontium pellucens, Psuedocalliergon trifarium, Racomitrium depressum, Rivulariella gemmipara, Schistidium cinclidodonteum, Tortula mucronifolia (moss)

Lichens
Bryoria subcana , Leptogium cyanescens, Lobaria linita, Ramalina pollinaria,

Fungi
Albatrellus avellaneus, Dermocybe humboldtensis, Gastroboletus vividus, Gastrolactarius camphoratus, Gymnomyces fragrans, Ramaria amyloidea , Ramaria rubella forma blanda, Rhizopogon chamaleontinus, Stagnicola perplexa,

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species** has been determined for the following Rogue River Siskiyou National Forest sensitive species; No individuals or populations are known from the project footprint and none were located during project surveys. This determination is based on the presence of suitable habitat within the project footprint. These species may be impacted during project implementation if undetected individuals or populations are present within the project area where suitable habitat occurs:

  Vascular Plants
  Adiantum jordanii (California Maiden-hair), Allium peninsulare (peninsular onion), Cheilanthes covillei (Coville's lip-fern), *Cryptantha simulans* (pine woods cryptantha), *Ericameria arborescens* (goldenfleece), *Keckelia lemmonii* (bush beardtongue), *Lotus stipularis* (stipuled trefoil), *Pellea andromedifolia (coffee fern), Pellea mucronata ssp. californica (birds-foot fern), Rhamnus ilicifolia* (redberry), *Solanum parishii* (Parish's horse-nettle)

  Bryophytes
  Entosthodon fascicularis, Porella bolanderi,

Fungi
Chamonixia caespitosa, Phaeocollybia californica, Pseudorhizina californica, Rhizopogon ellipsosporus, Rhizopogon exiguous

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Cypripedium fasciculatum* (clustered lady's-slippers). This species is known from 7 locations in the project footprint. There are occurrences in units 3, 21, 22, 23A, 24, 63, 508, and 509. Design features have been created to eliminate any direct effects to these populations. However, this species may be negatively impacted during project implementation if undetected individuals or populations are present but were not detected within the project area where suitable habitat occurs.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Iliamna lactibracteata* (California globe-mallow). This species is known from one location in the project footprint. The occurrence is in units 3, 14, and 50. Design features have been created to eliminate any direct effects to this population. However, this species may be negatively impacted during project implementation if undetected individuals or populations are present but were not detected within the project footprint where suitable habitat occurs. Long term beneficial effects are anticipated from project implementation. The species depends on disturbance specifically fire and open canopies and to regenerate, propagate, and maintain viable populations.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Pyrola dentata (toothed wintergreen).* This species is known from one location in the project footprint. The occurrence is in unit 47. Design features have been created to eliminate any direct effects to this population. However, this species may be negatively impacted during project implementation if undetected individuals or populations are present but were not detected within the project footprint where suitable habitat occurs. Long term beneficial effects are anticipated from project implementation. The species depends on disturbance specifically fire and open canopies and to regenerate, propagate, and maintain viable populations.

- The proposed Upper Briggs Restoration Project **may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species for** *Sophora leachiana* (western sophora). This species is known from many locations within the project footprint. There are occurrences in units 2, 3, 3S, 5, 9, 14, 15, 16, 35, 48, 240, 262, 503, 504, 505, 506, 510, and 652. Design features have been created to minimize adverse impacts to these populations. Short term impacts and direct effects may occur during project implementation. However, this species needs disturbance and open canopies to survive, propagate, and thrive. Long term impacts will beneficial to the species and occurrences. There may

be additional adverse impacts during project implementation if undetected individuals or populations are present but were not detected within the project footprint where suitable habitat occurs.

IX. DESIGN FEATURES

- **RRS Botanists will flag all appropriate sensitive plant occurrences**
- **RRS Botanists will be adequately notified prior to implementation to ensure flagging is in place**

- **If any additional sensitive species occurrences are located prior to or during implementation they will be flagged, buffered, and avoided. The specific area of the buffer will be determined on a site specific basis. The goal of the buffer will be to prevent direct disturbance to the plants and to protect the local habitat by minimizing disturbance to the soils, hydrology and mychorrhizal communities.**

Sensitive Plants 1- *Cypripedium fasciculatum* (clustered lady's slipper)

Cypripedium fasciculatum is a species that requires a closed canopy. The species mature individuals and reproductive strategies involve a symbiotic relationship with the mycorrhizal soils. Fire can impact the mycorrhizal soil profiles altering the viability of individuals and localized occurrences ultimately leading to mortality. Soil compaction negatively alters the below plant structures as well as mycorrhizal soils.

Threats to this species include timber harvest, road construction, trail construction, creation of recreation sites, and fire. Actions that alter the hydrology, moisture, and temperature regimes, disturb the soil and litter layers, or decrease the vegetation canopy may threaten the species.

All occurrences of *Cypripedium fasciculatum* will be buffered and flagged by up to a 100 foot radius. RRS botanists will flag the buffer. There are occurrences in unit 3, 21, 22 23A, 24, 63, 508 and 509. No project activities will occur within the buffered area. Project activities prohibited within the buffered/flagged areas include:

- No ground disturbance
- No temp roads
- No road decommissioning
- No landings
- No machinery (including ground based tree removal systems)
- No skid trails
- No tree/brush/plant removal
- No canopy disturbance
- No skyline/cable logging over buffered areas
- No fuel piling
- No pile burning
- No underburning or fire
- Directional fell trees away from buffered areas

Sensitive Plants 2 - *Iliamna lactibracteata* (California globe-mallow)

It is an early seral species with high reproductive rates, and occurs in the types of unstable and changing habitats that follow both cooler understory fires and hotter stand replacing fires. *Iliamna latibracteata* is a fire adapted species which responds to increased light exposure, decreased competition, and nutrient availability, as well as seed germination requirements of heat and/or smoke.

Iliamna latibracteata has a positive response to increasing light exposure in dense canopies. However, removal of too much canopy closure may result in too much light exposure and negative effects. The amount of optimum canopy removal is site specific and dependent on soil, elevation, aspect, and other variables. Soil compaction is detrimental to individuals and their underground roots and structures. Timber harvest and ground disturbing activities could reduce survival ship and seed production of mature plants. Landings and skid trails should be located away from California globe mallow populations.

The occurrences of *Iliamna latibracteata* will be buffered and flagged by a 30 foot radius from individuals. RRS botanists will flag the buffer. There is an occurrence in unit 3, 14, and 50. Hand thinning of overstory and underburning within the buffered area desired. Material will be piled outside the buffered areas. Lop and scatter material is acceptable and may be underburned within the buffered area. Individuals will be flagged avoided. The occurrence in Unit 50 is directly on the edge of the FS Road 2500. Pullouts and other vehicle and equipment activities will be prohibited within the buffered areas. Staging, decking, piling of timber are prohibited within the buffered areas.

Project activities prohibited within the buffered/flagged areas include:

- No ground disturbance such as ground based tree removal systems
- No temp roads
- No road decommissioning
- No staging
- No pullouts in road
- No landings
- No machinery (including ground based tree removal systems)
- No skid trails
- No skyline/cable logging over buffered areas
- No slash piling
- No fuel piling
- No pile burning
- Directional fell trees away from buffered areas

Sensitive Plants 3 - *Sophora leachiana* (western sophora)

Although this species is a vigorous vegetative colonizer of disturbed sites, it produces very few viable seeds, and so is unlikely to spread beyond the small area it now occupies. The

vegetative reproducing colonies are particularly vulnerable to physical disturbance during logging or construction activities.

Sophora acts as a primary colonizer, is dependent on disturbances to create the open sites, and possibly fire for seed scarification. The combination of having large seed, indehiscent pods, and limited seed production is extremely unusual for a pioneer species. When the tree canopy becomes re-established, Western sophora may persist vegetative as rhizomes and aerial shoots, but it ceases to flower.

Mature fruit has been rarely been found anywhere; the sites where seed has been observed are areas disturbed between 3-5 years prior (Crowder 1978, Kagan 1991). It is not known how long Sophora rhizomes and plants can survive in a forest without some type of fire or disturbance event. It is clear that the species does require disturbance and an open, sunny habitat for reproduction and long term survival.

There are occurrences in units 2, 3, 3S, 5, 9, 14, 15, 16, 35, 48, 240, 262, 503, 504, 505, 506, 510, and 652. Lop and scatter is permitted with underburning. Underburning is desirable. Western sophora needs open areas to thrive. Creating ½ to ¾ acre openings adjacent to plants (but not on existing plants) within the sophora area is desirable and recommended.

In Unit 2 and other units where there may be tractor logging within Sophora areas:

- **Individuals will be buffered up to 30 feet in radius determined by RRS Botanists**
- **This buffer will prohibit tractor logging and prohibited activities listed below**
- **Trees will be directional felled away from buffered areas**
- **Underburning will be allowed**

All Sophora Units - Project activities prohibited within the Sophora areas include:

- No temp roads
- No road decommissioning
- No landings
- No machinery such as ground based tree removal systems
- No skid trails
- No slash piling
- No fuel piling within 30 feet of individuals
- No pile burning within 30 feet of individuals

Road decommissioning activities

- Flag, buffer, and avoid all population on FS road 2500-100 including populations past Windy Creek
- Flag, buffer, and avoid population on FS roads 2500-603, 2500-606
- Flag, buffer, and avoid population on FS roads 2512-040

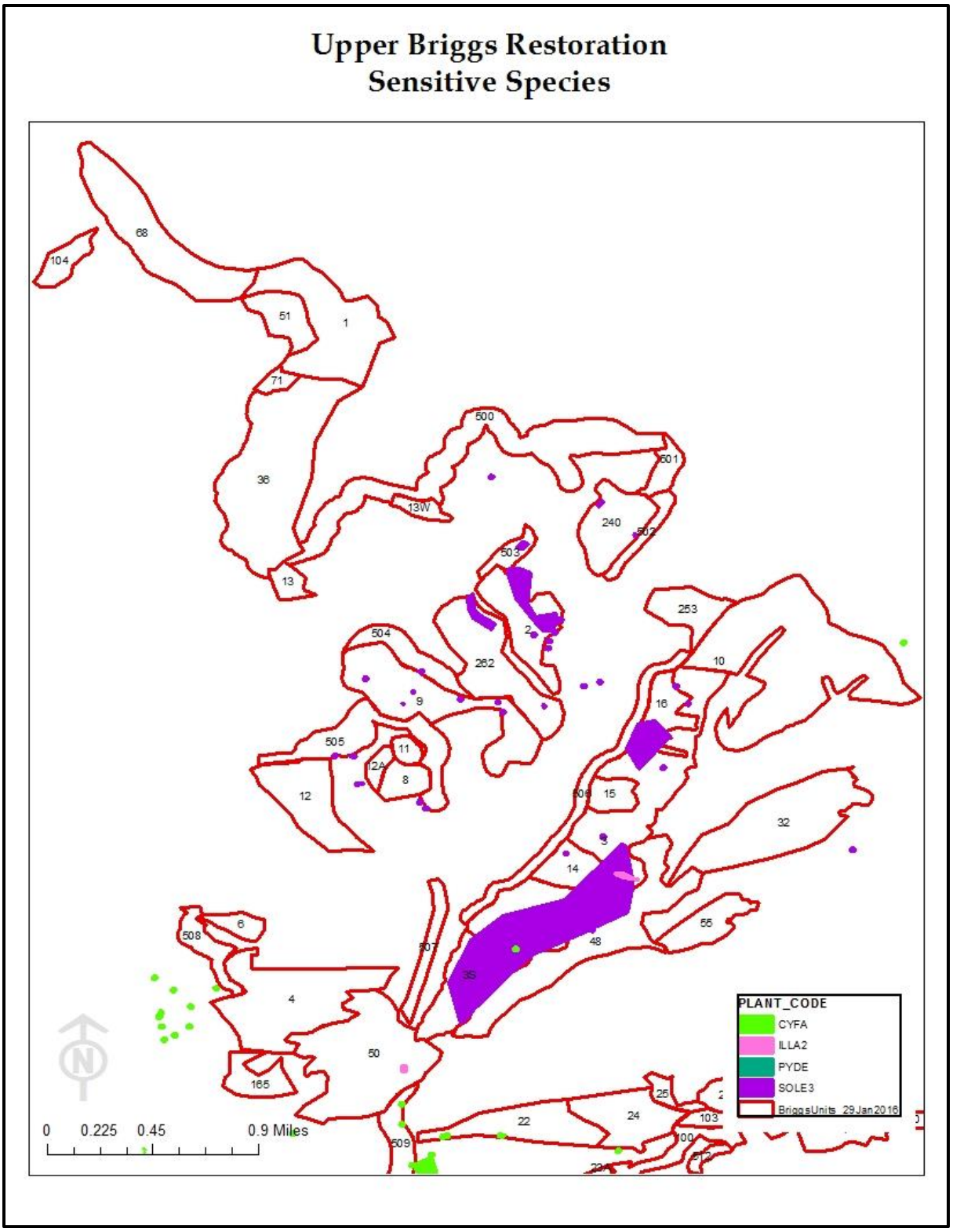
Sensitive Plants 4- *Pyrola dentata* (toothed wintergreen)

Pyrola dentata is a mycoheterotrophic species which growth strategies involve receiving nutrients from mycorrhiza in the soil as well as photosynthesis. Fire can impact the plants above ground structures and the mycorrhizal soil profiles altering the viability of individuals and localized occurrences. This can ultimately lead to mortality. Soil compaction negatively alters the below plant structures as well as mycorrhizal soils.

Threats to this species include timber harvest, road construction, trail construction, creation of recreation sites, and fire. Actions that disturb the soil and litter layers may threaten the species.

All occurrences of *Pyrola dentata* will be buffered and flagged by a 30 foot radius. RRS botanists will flag the buffer. There are occurrences in unit 47. No project activities will occur within the buffered area. Project activities prohibited within the buffered/flagged areas include:

- No ground disturbance
- No temp roads
- No road decommissioning
- No landings
- No machinery (including ground based tree removal systems)
- No skid trails
- No tree/brush/plant removal
- No canopy disturbance
- No skyline/cable logging over buffered areas
- No fuel piling
- No pile burning
- No underburning or fire
- Directional fell trees away from buffered areas


Upper Briggs Restoration
Sensitive Species
68
104
51
1
71
36
500
501
13W
240
507
503
13
253
504
2
262
10
9
16
505
11
12A
8
12
15
32
3
14
6
508
55
48
4
50
165
25
22
24
103
609
PLANT_CODE
CYFA
ILLA2
PYDE
SOLE3
BriggsUnits_29Jan2016
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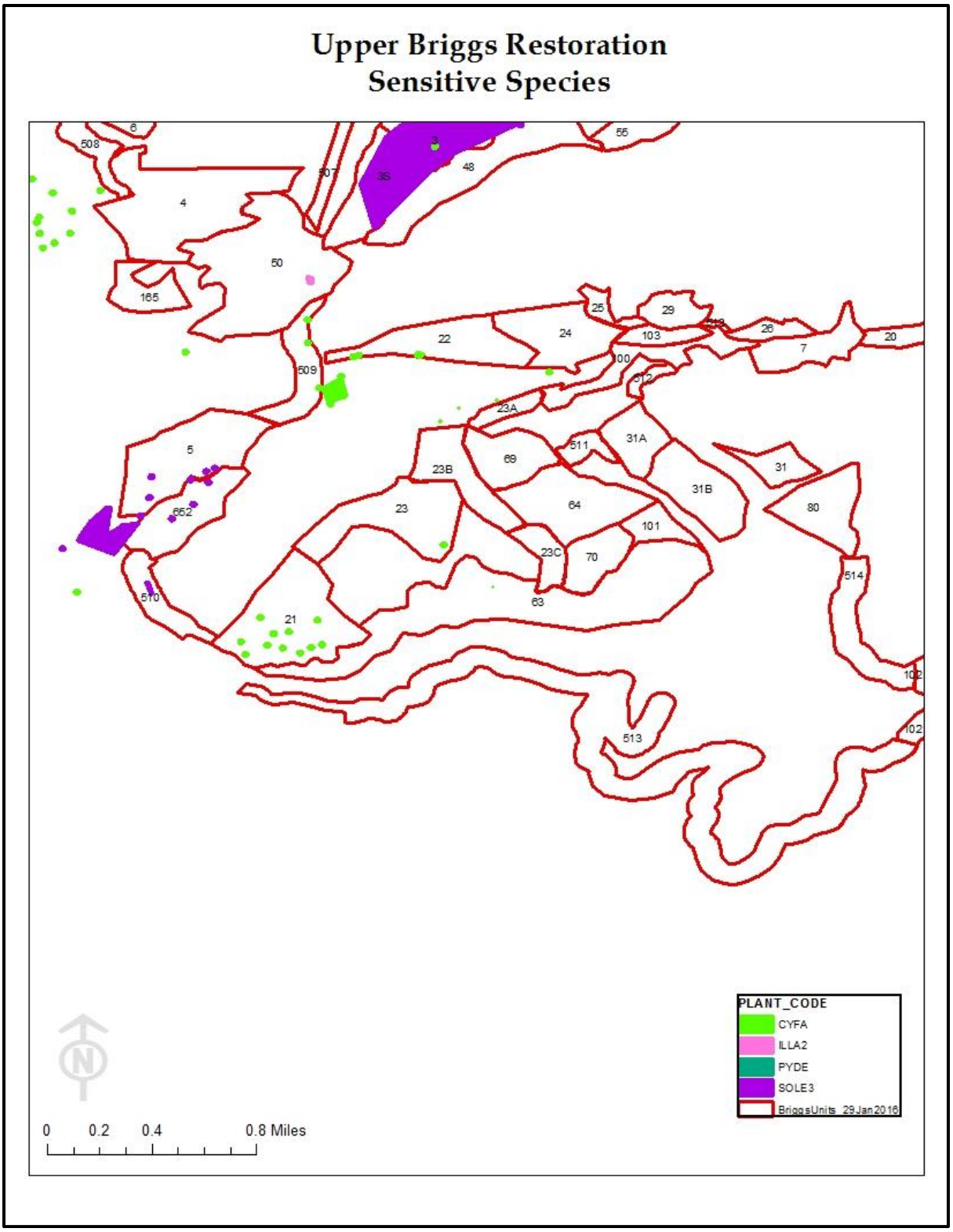
Upper Briggs Restoration
Sensitive Species
6
508
55
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4
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165
25
29
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103
26
20
7
509
100
23A
5
511
31A
69
23B
31
31B
64
23
652
101
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23C
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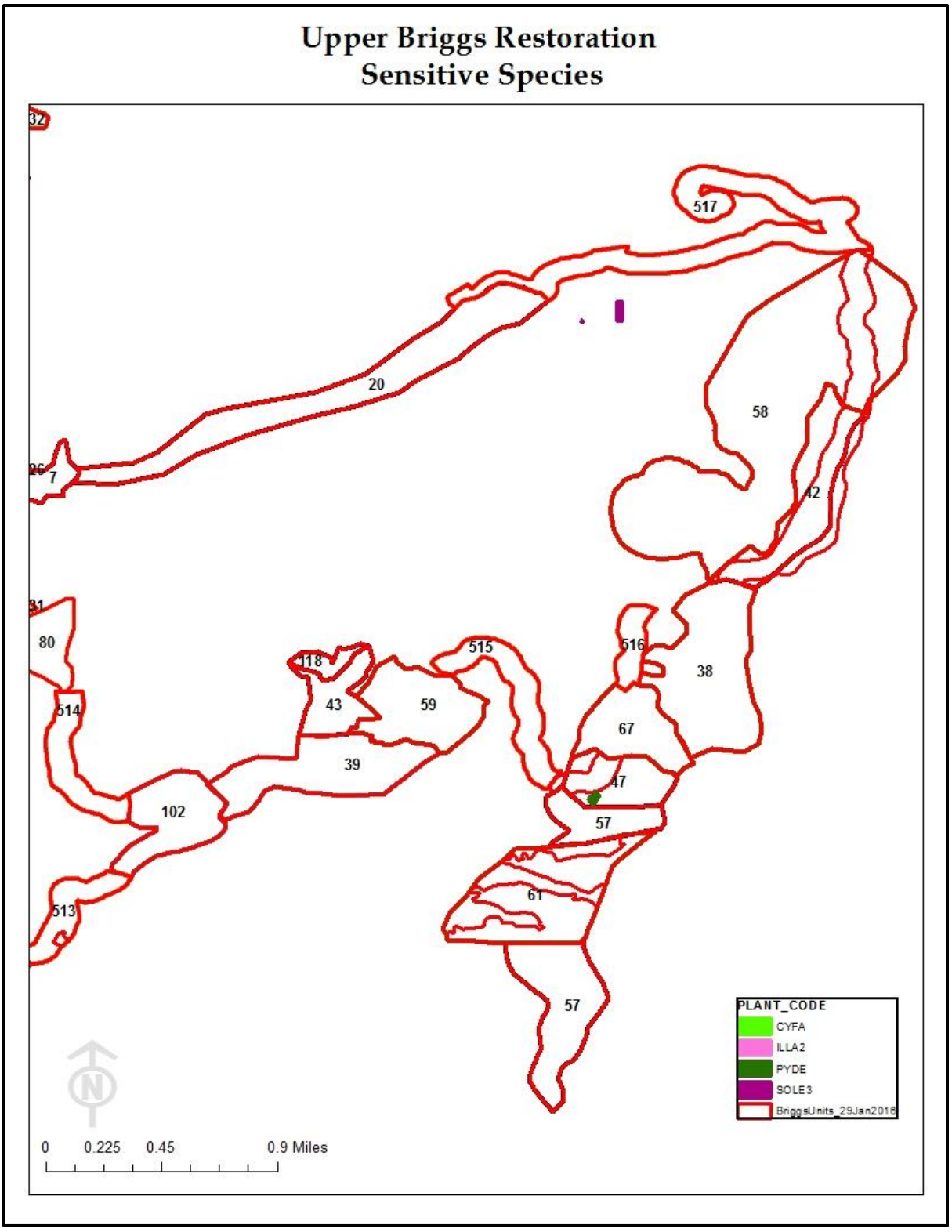

Upper Briggs Restoration
Sensitive Species
32
517
20
58
26
7
42
31
80
515
516
38
118
43
59
514
67
39
47
102
57
61
513
57
PLANT_CODE
CYFA
ILLA2
PYDE
SOLE3
BriggsUnits_29Jan2016
N
0
0.225
0.45
0.9 Miles

X. REFERENCES

Baskin, J. M. and Baskin, C. C. 1997. Methods of Breaking Seed Dormancy in the Endangered Species Iliamna corie with Special Attention to Heating. Natural Areas Journal (17): 313-323.

California Department of Fish and Game. 2008. California Natural Diversity Database, California Department of Fish and Game. Sacramento, CA.

California Native Plant Society. 2008. Inventory of Rare and Endangered Vascular Plants of California. Sacramento, CA.

Haskins, K. and Gehring, C. 2004. Long-term effects of burning slash on plant communities and arbuscular mycorrhizae in a semi-arid woodland. Journal of Applied Ecology (41): 379–388

Hickman, J.C., ed. 1993. The Jepson Manual. Higher Plants of California. Univ. of California Press, Berkeley

Interagency Special Status/Sensitive Species Program (ISSSSP) [Online] Available at: http://www.fs.fed.us/r6/sfpnw/issssp/planning-documents/

Jurgensen, M.F. et al. 1977. Impacts of timber harvesting on soil organic matter, nitrogen, productivity, and health of inland northwest forests. Forest Science 43(2):234-251

Kagan, J. 1991. Draft Management Guide for *Sophora leachiana*. Oregon Natural Heritage Program, Portland Oregon

Kalt, J. 2007. Conservation assessment and Monitoring Strategy for California Globe Mallow (*Iliamna lactibracteata*). USDA Forest Service Region 6, Oregon and Washington

Gray, E.C., T.N. Kaye, and A.S. Thorpe. 2012. Population Viability Analysis for the clustered lady's slipper (*Cypripedium fasciculatum*). Institute for Applied Ecology, Corvallis, Oregon and USDI Bureau of Land Management, Medford District. v + 21 pp.

Korb J., Johnson, N, and Covington, W. 2003. Arbuscular mycorrhizal propagule densities respond rapidly to ponderosa pine restoration treatments. Journal of Applied Ecology (40): 101–110

Mullens, L. and Showalter, R., 2007. Rare plants of Southwest Oregon. A collaborative effort between U.S. Department of Agriculture Forest Service, Bureau of Land Management, Oregon Flora Project and The Nature Conservancy.

Nature Serve Explorer. [Online] Available at: http://www.natureserve.org/explorer/servlet/NatureServe?init=Species (Accessed 11/ 2016)

Neary, D., Klopotakh, C., Debanoc, L, and Ffolliotic, P. 1999. Fire effects on belowground sustainability: a review and synthesis. Forest Ecology and Management (122): 51-71

Newton, R.E., R.T. Massatti, A.S. Thorpe, and T.N. Kaye. 2010. Population Viability Analysis for the clustered lady's slipper (Cypripedium fasciculatum). Institute for Applied Ecology, Corvallis, Oregon and USDI Bureau of Land Management, Medford District. iv + 11 pp.

Seevers J., Lang F. 1998 (reconfigured by Vance 2005). Conservation Assessment for *Cypripedium fasciculatum*. USDA Forest Service Region 6 and USDI Bureau of Land Management, Oregon and Washington.

USDA Forest Service 1989. Land Resource Management Plan, Siskiyou National Forest

USDA Forest Service. 2006. Forest Service Manual 2609.25. Region 6

USDA Forest Service. Forest Service Manual 2601.2; 2670.32; 2670.5; 2672.1

USFWS, Oregon Fish and Wildlife Office (https://www.fws.gov/oregonfwo/Documents/OregonSpeciesStateList.pdf). Updated October 17, 2016. Accessed on January 11, 2017

XI. APPENDIX

Sensitive Vascular Species with No Habitat in the Upper Briggs Restoration Project

Scientific name	Common Name	Habitat
Arabis mcdonaldiana	MacDonald's rockcress	Serpentine rock and soils
Arabis modesta	Rogue canyon rockcress	Deep soils on slopes, cliffs, shaded canyon ledges; below 1640 ft.
Arctostaphylos hispidula	Gasquet manzanita	Rocky serpentine soils or sandstone, interior chaparral, open woodland; 300-4000ft.
Arnica viscosa	Shasta arnica	Open, rocky, subalpine to alpine sites; 6500-8000 ft.
Asplenium septentrionale	Grass-fern	Granitc rock crevices 8000 ft.
Bensoniella oregana	Bensonia	Riparian; open fields and meadows; open woods and chaparral at elevations from 3,000-5,000 ft.
Boechera horizontalis	Crater lake rockcress	Volcanic soils above 7000 ft.
Botrychium pumicola	Pumice grape-fern	Open volcanic soils, above 6000 ft.
Calochortus howellii	howell's mariposa-lily	Serpentine soils
Camassia howellii	Howell's camas	Serpentine soils
Carex capitata	Capitate sedge	Peatlands, moist alpine meadows; 6200-13000 ft.
Carex comosa	Bristly sedge	Wet places below 1300 ft.
Carex diandra	Lesser panicled sedge	Marshy meadows peaty lakeshores; 400-8000 ft.
Carex klamathensis	A sedge	Serpentine wetlands
Carex lasiocarpa var. americana	Slender sedge	Lakes, pond shores, generally standing water; 1900-7000 ft.

Scientific name	Common Name	Habitat
Carex nervina	Sierra nerved sedge	Moist to wet places; 4000-10000 ft.
Castilleja schizotricha	Split-hair paintbrush	Decomposed granite or marble; 5000-7500 ft.
Cheilanthes intertexta	Coastal lipfern	Crevices, bases of rocks; 1000-9000 ft.
Chlorogalum angustifolium	Narrow-leaved amole	Heavy soils in grassland or woodland; below 1650 ft.
Cicendia quadrangularis	Timwort	Open places; below 8800 ft.
Collomia mazama	Mt. Mazama collomia	Open woods, wet meadows road cutbanks 4500-6000 ft.
Corydalis aquae-gelidae	Cold-water corydalis	gravel or sand substrates in shady conditions along cool stable stream reaches; 1350 – 5207 ft.
Cryptantha milo-bakeri	Milo baker's cryptantha	Rocky, gravelly, serpentine soils, generally open conifer forest, chaparral; 400-5700 ft.
Cyperus acuminatus	Short-pointed cyperus	Edges of ephemeral pools, ponds, streams, or ditches; blow 1200 ft.
Delphinium nudicaule	Red larkspur	Serpentine soils or rock ledges
Dicentra pauciflora	Few-flowered bleedingheart	Serpentine soils
Diplacus bolanderi	Bolander's monkeyflower	Burns, openings in chaparral, disturbed areas; 1000-2500 ft.
Diplacus congdonii	Congdon's monkeyflower	Disturbed areas, sloped runoff areas, generally granitic or serpentine soils; 1000-3000 ft.
Draba howellii	Howell's whitlow-grass	Rock crevices; above 4000 ft.
Epilobium oreganum	Oregon willow-herb	Darlingtonia wetlands and wet serpentine habitats
Epilobium siskiyouense	Siskiyou willow-herb	Scree, moist ledges, serpentine ridges; 5500-8200 ft.
Erigeron cervinus	Siskiyou daisy	Open, rocky slopes, meadows, forest; near seeps and vernally wet spots 3000-6200
Erigeron petrophilus	Cliff daisy	Rocky foothills to montane forest, on serpentine; 1640-7000 ft.
Eriogonum lobbii	Lobb's buckwheat	Common. Sand or gravel; 5200-12500 ft.
Erythronium howellii	Howell's adder's-tongue	Open serpentine woods
Eschscholzia caespitosa	Gold poppy	Open chaparral; below 6000 ft.
Frasera umpquaensis	Umpqua swertia	Mtn. meadows, openings and edge of forest; 5500-6500 ft.
Fritillaria gentneri	Gentner’s fritillaria	Oak woodlands, chaparral, grasslands
Gentiana newberryi var. newberryi	Newberry's gentian	Wet mountain meadows; 4000-7200 ft.
Gentiana plurisetosa	Elegant gentian	Wet mountain meadows and fens; 4000-7200 ft.
Gentiana setigera	Waldo gentian	Darlingtonia wetlands
Hackelia bella	Beautiful stickseed	Openings in forest, ridgetops, roadsides, streambanks; 4000-7000
Hastingsia bracteosa var. atropurpurea	Purple-flowered rush-lily	Darlingtonia wetlands
Hastingsia bracteosa var. bracteosa	Large-flowered rush-lily	Darlingtonia wetlands
Hesperocyparis bakeri	Baker's cypress	Mixed-evergreen forest, open slopes, flats, often on serpentine; 3500-6000 ft.
Hieracium horridum	Shaggy hawkweed	Rocky places, crevices; 4200-10000
Horkelia hendersonii	Henderson's horkelia	Dry granitic flats; 6500-75000 ft.
Horkelia tridentata ssp. tridentata	Three-toothed horkelia	Granitic or volcanic soils; 1000-8000 ft.

Scientific name	Common Name	Habitat
Lewisia leeana	Lee's lewisia	Granite, serpentine cliffs, rocky slopes, conifer forest; 4250-11000 ft.
Limnanthes alba ssp. gracilis	Slender meadow-foam	Wet meadows, edges of ephemeral streams; below 2500 ft.
Limnanthes floccosa ssp. bellingeriana	Bellinger's meadow-foam	Vernal pool edges; 1000-3600 ft.
Lomatium cookii	Cook's lomatium	Adjacent to serpentine habitats on alluvial silts or clay soils; low elevation
Lomatium engelmannii	Englemann's desert-parsley	Serpentine open slopes and in conifer forest; 3700-7500 ft.
Lupinus aridus ssp. ashlandensis	Mt. Ashland lupine	Subalpine, dry, gravelly openings in full sun or on ridgetops; >7000 ft.
Lupinus tracyi	Tracy's lupine	Dry, open montane forest; 3600-6500 ft.
Meconella oregana	(white fairypoppy)	Open ground and prairies on sandy, gravelly, or serpentine soils, often vernally moist. Below 3200 ft.
Monardella pupurea	(Siskiyou monardella)	Rocky, open slopes, chaparral, woodlands, and montane forest on serpentine soils 1400-4000 ft.
Nemacladus capillaris	(slender nemacaldus)	Dry slopes, burned areas, volcanic outcrops 1300-6900 ft.
Ophioglossum pusillum	Adder's-tongue	Marsh edges, low pastures, grassy roadside ditches, vernal pool margins; 3600-6500 ft.
Perideridia erythrorhiza	Red-rooted yampah	Vernally moist depressions in heavy, poorly drained soils. Josephine county sites on serpentine; <5000 ft.
Phacelia leonis	Siskiyou phacelia	Sandy flats, slopes, conifer forest; 3900-9000 ft.
Pilularia americana	American pillwort	Vernal pools, mud flats, lake margins; <6500 ft.
Pinus albicaulis	Whitebark pine	Upper red-fir forest to timberline, especially subalpine forest; 6500-12000 ft.
Plagiobothrys figuratus ssp. corallicarpus	Coral seeded allocarya	Vernally moist, rocky, open areas in grassland meadows
Plagiobothrys greenei	Greene's popcorn flower	Wet sites, grassland, woodland; <2950 ft.
Poa rhizomata	Timber bluegrass	Shady moist slopes in forest, in rich loose soils, on ultramafic substrates; 1300-3300 ft.
Polystichum californicum	California sword-fern	Woodland, streambanks, to rocky open slopes; 3600 ft.
Prosartes parvifolia	Siskiyou fairy bells	Montane conifer, mixed-evergreen forest, exposed roadsides; 2000-5000 ft.
Rafinesquia californica	California chicory	Open sites in scrub, woodland; often common after fire; 300–4900 ft.
Rhynchospora alba	White beakrush	Boggy open sites; 6500 ft.
Ribes divaricatum var. pubiflorum	straggly gooseberry	Coastal bluffs, forest edges; sea level to 4900 ft.
Romanzoffia thompsonii	Thompson's mistmaiden	Sunny, vernally wet, mossy, rocky hillsides; 750-6000 ft.
Rorippa columbiae	Columbia cress	Streambanks, lake or pond margins, meadows, wet fields; 3300-5900 ft.
Saxifragopsis fragarioides	Joint-leaved saxifrage	Rock crevices; 4500-9550 ft.
Scheuchzeria palustris ssp. americana	Scheuchzeria	Floating mats, bogs, lake margins; 4600-6500 ft.

Scientific name	Common Name	Habitat
Schoenoplectus subterminalis	Water clubrush	Fresh lakes, streams low in nutrients; <7500 ft.
Scirpus pendulus	Drooping bulrush	Marshes, wet meadows; <2950 ft.
Scoliopus bigelovii	California fetid adderstongue	Moist, shady redwood forest; 3600 ft.
Sedum moranii	Rogue River stonecrop	Serpentine rock outcrops in lower Rogue River canyon.
Sidalcea malviflora ssp. patula	Coast checker bloom	Open coastal forests, bluffs; 2300 ft.
Silene hookeri ssp. bolanderi	Bolander's catchfly	Serpentine and non-serpentine soils, oak, conifer woodland; 3200 ft.
Streptanthus glandulosus	Common jewel flower	Serpentine outcrops; 1500-2500 ft.
Streptanthus howellii	Howell's streptanthus	Open conifer/hardwood forest on rocky serpentine; 2000-2600 ft.
Tauschia howellii	Howell's tauschia	Granitic gravel, ridge tops, Abies forest; 6500-8200 ft.
Tetrapteron graciliflorum	Slender-flowered evening-primrose	Open or shrubby slopes, generally clay soils, grassland, oak woodland; <2600 ft.
Trillium kurabayashii	Siskiyou trillium	Montane conifer forest, foothill woodland, chaparral, riparian woodland; 100-6500 ft.
Utricularia minor	Lesser bladderwort	Shallow acidic waters; 2600-9500 ft.
Viola primulifolia ssp. occidentalis	Western bog violet	Marshes, bogs, often with Darlingtonia; 300-1600 ft.
Wolffia columbiana	Columbia water-meal	Fresh water; < 650 ft.
Zigadenus fontanus	Small-flowered death camas	Vernally moist or marshy areas, often serpentine; <1600 ft.

Sensitive Non-Vascular Species with No Habitat in the Upper Briggs Restoration Project

Scientific Name	Common Name	Habitat
Albatrellus avellaneus	Fungus	112-1260' elevation
Anastrophyllum minutum	Liverwort	Grows on peaty soil at relatively high elevations above 5500' ft.
Andreaea schofieldiana	Moss	habitat Brandy peak Gold beach
Bryoria subcana	Lichen	coastal no habitat out of range
Bryum calobryoides	Moss	Red mountain habitat
Calypogeia sphagnicola	Liverwort	sphagnum habitat
Cephaloziella spinigera	Liverwort	bog fen species
Clavulinopsis fusiformis	Fungus	Presumably saprobic; growing in dense clusters with fused bases, or occasionally gregariously; in woods under hardwoods or conifers, sometimes in grass; summer and fall
Cryptomitrium tenerum	Liverwort	Forming small to locally extensive mats on bare, usually shaded and humid soil on hillsides, rock outcrops, and streambanks.. Root balls and cutbanks are favored habitat in forests. Forest types range from Pseudotsuga menziesii, Tsuga heterophylla, and Abies

Scientific Name	Common Name	Habitat
		amabilis associations. In Oregon below 1000 ft. Below 2500 ft. in California.
Encalypta brevicollis	Moss	habitat rock outcrops
Encalypta brevipes	Moss	habitat rock outcrops
Gastroboletus vividus	Fungus	found at 4200-6700 ft.
Gastrolactarius camphoratus	Fungus	Old growth; associated with the roots of Western Hemlock (Tsuga heterophylla) and possibly Sitka Spruce (Picea sitchensis) from sea level to 3,039 ft.
Gymnomyces fragrans	Fungus	4803-6853 feet in elevation
Harpanthus flotovianus	Liverwort	Bog fen species
Kurzia makinoana	Liverwort	coastal no habitat out of range
Leptogium cyanescens	Lichen	On shaded twigs of deciduous trees and shrubs in humid habitats, rarely in exposed situations; below 1500 ft.
Lobaria linita	Lichen	Habitat rock faces
Lophozia gillmanii	Liverwort	Peaty soil 6500'
Orthodontium gracile	Moss	redwood habitat
Orthodontium pellucens	Moss	redwood habitat
Phymatoceros phymatodes	Liverwort	Moist bare mineral soil 0-2500 feet
Pseudocalliergon trifarium	Moss	Forming lawns or inconspicuously intermixed with other bryophytes in medium to rich montane fens where it grows submerged to emergent in pools or on saturated ground, usually in full sunlight 5000-6000 ft.
Racomitrium depressum	Moss	Forming mats on rocks in perennial or intermittent streams, and in the spray zone of waterfalls, between 400 and 11,000 ft.
Ramalina pollinaria	Lichen	On bark, twigs, and wood of conifers, hardwoods, shrubs, and rarely rock along the immediate coast. Forest types are *Picea sitchensis* and *Tsuga heterophylla* associations.
Rhizopogon chamaleontinus	Fungus	Douglas-fir-Tanoak series/wet Douglas-fir-Incense cedar association at 319 m. (1,047 feet) elevation. The Medford District BLM site is located in the Douglas-fir series/wet Douglas-fir association at 342 m. (1,121 feet) elevation.
Rhizopogon ellipsosporus	Fungus	Douglas-fir/tanoak series/wet Douglas-fir/wet Douglas-fir-incense cedar association. Elevation of the sites ranges from 317 m. (1,040 feet) to 1,255 m. (4,116 feet) with a mean of 634 m. (2,079 feet).
Rhizopogon exiguus	Fungus	Douglas-fir series/wet Douglas-fir habitat association. 16 m. (54 feet) to 1,172 m

Scientific Name	Common Name	Habitat
Rivulariella gemmipara	Liverwort	Grows attached to rocks in moderately fast moving water. Found only where permanent springs keep the streambed submerged at all times; can be submerged or emergent in the splash zone; 5000-7000 ft.
Schistidium cinclidodonteum	Moss	submerged at all times, and it favors sites in open areas, exposed to sun most of the day.
Stagnicola perplexa	Fungus	saprophytic on very rotten conifer wood in boggy or wet areas or recently dried depressions in boreal coniferous forests. No Habitat
Tortula mucronifolia	Moss	in range and habitat may not occur on the forest

UPPER BRIGGS RESTORATION PROJECT
Botany Specialist Report for Strategic and Survey and Manage Species

Wild Rivers Ranger District, Rogue River Siskiyou National Forest, Josephine County, Oregon

PREPARED BY: /s/ Stuart Osbrack DATE: February 12, 2017
Stuart Osbrack District Botanist

I. INTRODUCTION

The purpose of this botany report is to describe the effects of the Upper Briggs Restoration Project on Strategic and Survey and Manage species of the Rogue River-Siskiyou National Forest (RRSNF). These are species of that are otherwise not covered in the botanical Biological Evaluation report.

Strategic are species that have been reviewed for the sensitive plant list and did not meet all the criteria, but are of sufficient concern to be considered in the planning process. These include species that are locally rare (as opposed to declining throughout their range), are of public concern, occur as disjunctive populations, are newly described taxa, or lacking information on population size, threats, trend, or distribution.

These species make an important contribution to forest biodiversity and should be maintained under the provisions of National Forest Management Act (NFMA) and addressed as appropriate under the National Environmental Policy Act (NEPA). These species are not incorporated into the Biological Evaluation which is reserved for sensitive species, but are included in this Specialist Report in order to present the analysis of potential impacts to the species and provide any mitigations if necessary.

Survey and manage species require protection of known sites as directed by the Survey and Manage Standard and Guidelines set forth in the 2001 Record of Decision. Only species in Category A and C require pre-disturbance surveys that are practical. However, if there are known sites from Category B and D species they are required to be protected and managed as well.

Table 1 lists Strategic species that are known to or may occur on the RRSNF. Table 2 represents the updated 2003 Survey and Manage Species list for the Survey and Manage Standard and Guidelines from the 2001 Record of Decision. Species that do not have potential habitat in the Upper Briggs Restoration project area, based on Table 1, Table 2, or other information are not further analyzed in this document. A review of the RRSNF flora and fauna atlases and available Geographic Information System (GIS) coverage(s) was performed to evaluate the extent of potential habitat within the project area. Botanical surveys that have been conducted in 1999, 2001, 2009, 2010, 2011, 2012, 2015, 2016, and 2017 at the appropriate timing to identify target species. Surveys focus on species with potential habitat; however, surveys are floristic in nature and an attempt will be made to identify all species encountered in the field. Many species have specific habitat preferences (such as wet meadows or boulder outcrops), and botanists will search for these as well as their constituent species.

Table 1. The Strategic vascular, bryophyte, and lichen species that are known to occur or may occur on the RRSNF are displayed. Species that do not have potential habitat within Upper Briggs Restoration Project boundary are not considered further. Species list is current and was last revised in July 2015.

SCIENTIFIC NAME	COMMON NAME	HABITAT	PRESENT IN PROJECT FOOTPRINT
Vascular Plants			
Allium bolanderi var. bolanderi	Bolander onion	Uncommon. Rocky clays including serpentine; Below 3200 ft.	No
Baccharis douglasii	Marsh baccharis	Coastal freshwater and saltwater marshes, streambanks; below 3900 ft.	No
Carex crawfordii	Crawford's sedge	Often in standing water, moist to wet places; below 5000 ft.	No
Chaenactis suffrutescens	Shasta pincushion	Unstable, sandy to rocky, generally serpentine soils, scree, drainages; 2300-7500 ft.	No
Clintonia andrewsiana	Andrew's bead-lily	Shaded, damp redwood forest; below 1300 ft.	No
Horkelia sericata	Silky horkelia	Dry, rocky serpentine clay, open chaparral or pine forest; 2600-4000 ft.	No
Erigeron klamathensis	Klamath daisy	Open, rocky slopes, ridges, crevices; 2300-7000 ft.	No
Erigeron stanselliae	Stansell's daisy	Serpentine coast range	No
Lilium kelloggii	Kellogg's lily	Gaps, roadsides in conifer forest or chaparral; 700-4200 ft.	No
Pinus sabiniana	Gray pine	Foothill woodland, northern oak woodland, chaparral, infertile soils in mixed-conifer and hardwood forests; 500-5000 ft.	No
Piperia candida	White piperia	Open to shady sites, conifer and mixed-evergreen forest; below 5000 ft.	Yes
Rhynchospora capitellata	Brownish beakrush	Wet meadows, fens, seeps, marshes; below 6500 ft.	No
Rosa gymnocarpa var. *serpentina*	Serpentine dwarf rose	Full sun in chaparral, dwarf forest on ultramafic substrates; 1300-5000 ft.	No
Sidalcea malachroides	Maple-leaved sidalcea	Woodland, clearings near coast; below 2300 ft.	No
Silene hookeri ssp. *serpentinicola*	Serpentine catchfly	Serpentine soils, chaparral, conifer forest; 300-2500 ft.	No
Lichen			
Collema quadrifidum	Lichen	Epiphytic, on bark of *Quercus garryana* trees in oak savanna. It typically occurs on open grassy hillsides and ridges where soils are thin and annual grasses and mosses dominate ;1500-3000ft.	No
Collema undulatum var. granulosum	Lichen	On periodically moistened calcareous rocks or on mosses over rocks, occasionally on soil	No
Heterodermia leucomelos	Lichen	In Oregon grows on small branches of *Picea sitchensis* (Sitka spruce) on forested headlands in the coastal fog zone, and it may also grow on *Pinus contorta* (shore pine) in this habitat.	No
Lecanora caesiorubella ssp. merrillii	Lichen	On bark of trees and shrubs, and on decaying wood (including redwood fenceposts) in dry, open deciduous or coniferous woodland, chaparral, and salt marsh from sea level to about 1500 ft.	No

SCIENTIFIC NAME	COMMON NAME	HABITAT	PRESENT IN PROJECT FOOTPRINT
Leptogium plicatile	Lichen	Moist, calcareous rocks or soil. On non-calcareous rocks with seeps providing lime to the rock surface, in a seasonally wet small meadow, low trees and brush 600 ft.	No
Peltula euploca	Lichen	Noncalcareous rock, in exposed, dry, or shaded and damp habitats. In southwestern Oregon it occurs on basalt in dry *Quercus* and *Pinus ponderosa* associations, and on at edges of vernal pools	No
Ramalina intermedia	Lichen	On rock	No
Schaereria dolodes	Lichen	On bark of conifers mostly *Pseudotsuga menziesii*, 1500 –11000 ft.	No
Sigridea californica	Lichen	On bark of trees and shrubs, and on decaying wood in dry, open deciduous or coniferous woodland and chaparral. In Oregon, the forest type of the single known locality is a Picea sitchensis association.	No
Umbilicaria hirsuta	Lichen	The single known population in Oregon occurs on the vertical face of an igneous rock outcrop (noncalcareous) with an intermittent seep, in partial shade	No
Usnea lambii	Lichen	On acidic rocks and boulders in open subalpine to alpine habitats. Where trees are present, forest types are *Tsuga mertensiana*, *Abies lasiocarpa*, and *Pinus albicaulis* associations.	No
Bryophyte			
Anoectangium aestivum	Moss	Moist cliffs, humid cliff crevices, and overhanging rocks (acid and basic). Coastal areas.	No
Anomobryum julaceum	Moss	Earth cliff crevices, cliff crevices, on tussock tundra with seeps and late snow melt areas, and on granitic outcrops	No
Bruchia bolanderi	Moss	Subalpine zone and montane meadows and stream banks only in the Cascade Range between 3500 - 5000 ft..	No
Bryum calobryoides	Moss	On other mosses, on both acid and basic rocks and soil in shaded to exposed boulder fields, montane to alpine meadows, cliffs, and outcrops. Elevations range from 3000 - 7000 ft.	No
Campylopodiella flagellacea	Moss	Peaty soil; seeping metamorphic rock road bank.	No
Campylopus subulatus	Moss	Oak woodland, Douglas-fir forest and on sand dunes with *Pinus contorta* from 250- 650 ft. Along coast.	No
Didymodon norrisii	Moss	Rock, outcrops, calcareous and volcanic boulders, fields, and cliffs in runoff areas, in low to moderate elevations 650-5000 ft.	No
Hygrohypnum alpinum		On emergent rocks that are subjected to spray from turbulent water, it occurs on large boulders, on the banks of or in small swiftly running mountain streams. Above 4000 in southern Oregon.	No
Orthotrichum bolanderi	Moss	Forming loose, spreading mats on dry igneous and sedimentary rocks and faces of cliffs in areas with a Mediterranean climate. Forest types include *Pinus ponderosa, Pseudotsuga menziesii* and *Quercus garryana* associations below 3000 ft.	No

SCIENTIFIC NAME	COMMON NAME	HABITAT	PRESENT IN PROJECT FOOTPRINT
Orthotrichum hallii	Moss	Occurs on rocks, usually limestone or calcareous sandstone. Occasionally it is found on granite, quartzite or basalt. Above 2300 ft.	No
Philonotis yezoana	Moss	Over rock in shaded stream gorges and on cliffs or steep slopes wet by seepage; below 8000 ft.	No
Pohlia bolanderi	Moss	Dry soil in alpine and subalpine areas, and occasionally along streams in high montane to alpine areas; base of cliffs and boulders in open lava field, west slope; on thin dry soil over rock; on dry shaded rock; on dry soil in graminoide meadow; and on dry exposed soil in alpine tundra near summit. 5400 - 7000 ft.	No
Pohlia cardotii	Moss	Wet soil or along snowmelt streamlets in subalpine and alpine habitats. Elevations range from 6000-8000 ft.	No
Pohlia obtusifolia	Moss	Moist rich soil in snowmelt areas within the alpine zone.	No
Pohlia tundrae	Moss	Restricted to alpine and subalpine habitats in the Pacific Northwest,	No
Ptychostomum cyclophyllum	Moss	Wet soil at both low and high elevations. Substratum includes wet soil along the edge of ditches or among tree roots subject to inundation, wet seepage beside gravel runway, on silty-clay wet area of muskeg, on tundra, and near a stream in a black spruce stand.	No
Racomitrium ryszardii (Codriophorus ryszardii)	Moss	Forming mats on shaded, moist rocks and cliffs along shady streams or in forests, often in the splash zone, but never aquatic. 1000-6000 ft. Forest types are primarily *Pseudotsuga menziesii, Tsuga heterophylla,* and *Picea sitchensis* associations.	No
Schistidium tenerum	Moss	On exposed, dry rock outcrops and on moist shaded soil in crevices on a rock outcrop. 5700-6736 ft.	No
Scouleria marginata	Moss	occurs on bedrock material or very large boulders along the margins of perennial river systems; below 4000 ft.	No
Thamnobryum neckeroides	Moss	Rocks and trees, often in shaded, damp locations in mixed Doug-fir/western hemlock forest with *Acer macrophyllum*. Below 6600 ft.	No
Tortella fragilis	Moss	Rock or occasionally on dry soil in exposed locations. Sea level to alpine.	No
Tortella tortuosa var. tortuosa	Moss	On rock or occasionally on dry soil in exposed locations. Calcareous cliffs from sea-level to alpine elevations.	No
Trichostomum crispulum	Moss	Grows on shaded or unshaded calcareous or base-rich rock ledges, and may abound on the damp floors of disused limestone quarries.	No
Trichostomum tenuirostre var. tenuirostre	Moss	Soil, sandstone, calcareous rock, bluffs, boulders, under overhanging ledges, seepage areas, logs; below 7500 ft.	No
Triquetrella californica	Moss	Forming loose mats on exposed to shaded soil, rocks, sand, or gravel in dry or moist situations. Below 1600 ft. within 10 miles of the coast.	

Table 2. 2003 Survey and Manage Species list with Category Assignment which require pre-disturbance surveys. Species that do not have potential habitat within Upper Briggs Restoration Project boundary are not considered further.

SPECIES	CATAGORY	HABITAT	PRESENT IN PROJECT FOOTPRINT
Fungi			
Bridgeoporus nobilissimus (Oxyporus nobilissimus)	A	Large, dying and dead noble fir and Pacific silver fir in late-successional old-growth forests and on remnant stumps and snags in young and mature second-growth forests in the Pacific silver fir and western hemlock zones in western Washington and Oregon	No
Lichen			
Bryoria pseudocapillaris	A	Conifers of coastal dunes and headland forests	No
Bryoria spiralifera	A	Exposed or moderately exposed coastal trees, snags and shrubs, in forests or woodlands of windswept dunes and headlands	No
Hypogymnia duplicata	C	It grows as an epiphyte on mountain hemlock, western hemlock, Pacific silver fir, Douglas-fir and subalpine fir in old-growth forests of the western Cascades, Olympics and Coast Range, primarily between 1100-5450 ft.	No
Leptogium cyanescens	A	On shaded twigs of deciduous trees and shrubs in humid habitats, rarely in exposed situations. The two Oregon sites are on the immediate coast at elevations of 15-30 feet.	No
Lobaria linita, var. tenuoir, In WA WL, WA WC south of Snoqualmie Pass, WA EC; OR	A	Old-growth and climax forests in the *Abies amabilis* to lower *Tsuga mertensiana* zones, in mesic to moist *Vaccinium alaskaense* plant associations, between 700-4500 ft. Also mossy, north-facing rock outcrop at 4400 ft.	No
Nephroma occultum	C	Old growth and younger forests of *Pseudotsuga menziesii* and *Tsuga heterophylla* in the Cascade Range below approximately 3000 ft., often associated with *Lobaria oregana*.	No
Niebla cephalota	A	Areas with high humidity and fog along coast	No
Pseudocyphellaria perpetua (*Pseudocyphellaria sp. 1*)	A	Old spruce forest on immediate coast	No
Pseudocyphellaria rainierensis	A	Conifer trees in cool, humid, old-growth to climax forests in the Western Hemlock or lower Pacific Silver Fir zones. The elevational range of known sites is between 330-4000 ft.	No
Teloschistes flavicans	A	Coastal headlands forest.	No
Usnea longissima, In California and in Curry, Josephine, and Jackson Counties, Oregon	A	Old-growth and late-successional conifer stands, hardwood stands, and riparian areas, particularly in coastal climates or on fog-swept mountains where humidity is high.	No
Bryophytes			
Schistostega pennata	A	Mineral soil in crevices on lower, sheltered parts of upturned tree root wads, ceilings of caves, crevices in soil banks, animal burrows, rarely on the shaded sides of deep pits along the upper banks of perennial streams, occasionally on rock; low to high elevations below 5500 ft.; Damp mineral soils with a source of dim light	No
Tetraphis geniculata	A	Occurs on the cut or broken ends or lower sides of large (usually over 15 inches in diameter in Oregon and Washington), decay class three, four and five rotted logs or stumps, and occasionally on peaty banks in moist coniferous forests from sea level to subalpine elevations.	No
VASCULAR PLANTS			
Bensoniella oregana, In California only	A	Sensitive plant addressed in Botanical Biological Evaluation	No
Botrychium minganense, In Oregon and California	A	Meadows, open forest along streams or around seeps; 5000-10000 ft.	No

SPECIES	CATAGORY	HABITAT	PRESENT IN PROJECT FOOTPRINT
Botrychium montanum	A	Shady conifer woodland, especially under *Calocedrus* along streams and seeps; 5000-7000 ft.	No
Coptis asplenifolia	A	Moist forests and bogs at low to middle elevations, in areas with a strong maritime influence	No
Coptis trifolia	A	Boggy, wet seepage areas, sphagnum hummocks, muskegs to deep woods, and mossy places; 3280-3800 ft.	No
Corydalis aquae-gelidae	A	Sensitive plant addressed in Botanical Biological Evaluation	No
Cypripedium fasciculatum, WA outside Eastern Cascades; OR; CA	C	Sensitive plant addressed in Botanical Biological Evaluation	Yes
Cypripedium montanum, Entire range except Washington Eastern Cascades Physiographic Province	C	Moist areas, dry slopes, mixed-evergreen or conifer forest; 700-7000 ft.	No
*Eucephalus vialis (*syn. *Aster vialis)*	A	Meadows, open oak or conifer woodland; 1500-5000 ft.	No
Galium kamtschaticum, Olympic Peninsula, WA Eastern Cascades, OR & WA Western Cascades Physiographic Provinces, south of Snoqualmie Pass	A	moist, cold, coniferous forests and mossy places throughout its range, restricted to seeps with nearly year-round saturated soil; 1500-3500 ft.	No
Platanthera orbiculata var. *orbiculata* (syn. *Habenaria orbiculata*)	C	Damp rich humus in the deep shade of heavily forested areas; dry to mesic, or moist, or even swamps and bogs; mature to old-growth forests; found in western hemlock and Pacific silver fir zone.	No

II. DETERMINATIONS

The determinations follow the guidelines and definitions established by the Forest Service (USDA 1996 and USDA 2000) for sensitive species and are described in brief next.

- Determinations of No Impact are usually appropriate only if the project is not located in (or does not affect) suitable or critical habitat and if disturbance or other direct or indirect impacts to the species are not an issue. Projects within suitable or critical habitat must demonstrate that there are no direct or indirect impacts to the species or its habitat to support a No Effect determination. No Effect determinations are unusual if suitable habitat for a species is in any way entered or otherwise affected.

- Determinations of Not Likely Contribute to a Trend Toward Federal Listing or Cause aa Loss of Viability to the Population or Species are usually appropriate when the project occurs in (or impacts) suitable habitat or results in disturbance to the species, but compliance with any existing terrestrial or aquatic conservation strategies can be shown.

- Determinations of With a Consequence that Action May Contribute to a Trend Toward Federal Listing or Cause a Loss of Viability to the Population or Species are usually appropriate when the project occurs in (or affects) suitable habitat or results in

disturbance to the species, and compliance with existing conservation strategies cannot be demonstrated.

III. EFFECTS OF THE PROPOSED PROJECT

The populations of strategic and survey and manage species are itemized below in table 2. There are no other known strategic or survey and manage species within the proposed Upper Briggs Restoration Project footprint. However the entire area has not yet been surveyed and there is potential for them to occur. The remaining units (refer to Botanical Biological Evaluation for units to be surveyed) will be surveyed at the recommended intensity by Rogue River-Siskiyou National Forest botanists prior to project implementation and reported in the Final EA documentation.

Table 3. Known Strategic and Survey and Manage species in the project footprint.

Species	Unit Alt 2	Unit Alt 3	Status
Piperia candida (white piperia	7, 22, 38, 13W	38, 13W	strategic
Elaphomyces reticulatus (fungi)	Big Pine campground road loop meadow, not in any unit	Big Pine campground road loop meadow, not in any unit	strategic
Otidea leporina (fungi) (category D)	12, 14, 48	12, 14, 48	survey and manage
Ramaria rubripermanens (fungi) (category D)	510	510	survey and manage
Sparassis crispa (fungi) (category D)	Big Pine campground road loop meadow	Big Pine campground road loop meadow	survey and manage
Spathularia flavida (fungi) (category B)	57	57	survey and manage
Tylopilus porphyrosporus (fungi) (category D)	8, 505, road decommissioning	8, 505, road decommissioning	survey and manage

The extent to which cumulative effects may influence sensitive botanical resources is dependent upon management of potential direct and indirect project effects, as well as the attributes of the plant species located within the analysis area, their distribution within the analysis area, and the ability to design future projects with an effective conservation component. Overall, management of the direct and indirect effects through project design and implementation of appropriate mitigation measures will minimize the potential for negative cumulative effects.

For Alternative 1, there are not expected to be any direct, indirect, or cumulative effects.

For Alternative 2 or 3, strategic and survey and manage species within the project area could be damaged or killed if equipment runs over them or parks on them, if logs are felled on or skidded over them, if they are trampled, if slash piles block their light, if litter or duff is removed, mycorrhizae host trees removed, and if piles are burned directly over them and the heat intensity is too great for the plants to survive.

Direct, indirect, and cumulative effects can be minimized by following Forest Service standards and guidelines and by implementing the stated design measures for the project alternatives. Minimizing direct effects is the largest individual factor in reducing cumulative effects to strategic and survey and manage species. With the design measures in place, cumulative effects are less likely to occur or be adverse. All occurrences will be buffered and protected eliminating all direct effects. There could be indirect effects if noxious weed infestations are introduced or spread into populations. There could be negative cumulative effects to strategic and survey and manage species present in the project footprint if noxious weeds are spread into populations reducing habitat and altering the native species communities and composition. Mitigations for noxious weeds have been created to reduce the risk of weed establishment or spread (refer to Upper Briggs Restoration Project Invasive Risk Assessment).

Below highlights the design measures that are expected to minimize affects

- If any target species are found during pre-implementation surveys, flagging will be placed to delineate a protective boundary, which will include up to a 100-ft "no activity" buffer.
- All known strategic and survey and manage species will be flagged to delineate a protective boundary, which will include up to a 100-ft "no activity" buffer.
- Rogue River-Siskiyou Botany Department will delineate and flag the protective species boundaries.

Table 4. The determination of risk and effect for the strategic species are displayed.

Species	Presence in Project Footprint	Probability of Effect	Consequence of Effect	Cumulative Effect	Determination of Effect – Alternative 1	Determination of Effect – Alternative 2 & 3
Elaphomyces reticulatus (fungi)	Yes	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Orthotrichum bolanderi (moss)	No	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss

Species	Presence in Project Footprint	Probability of Effect	Consequence of Effect	Cumulative Effect	Determination of Effect – Alternative 1	Determination of Effect – Alternative 2 & 3
						Of Viability To The Population Or Species
Piperia candida (white piperia)	Yes	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Schaereria dolodes (lichen)	No	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Thamnobryum neckeroides (moss)	No	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species

Table 5. The determination of risk and effect for the survey and manage species are displayed.

Species	Presence in Project Footprint	Probability of Effect	Consequence of Effect	Cumulative Effect	Determination of Effect – Alternative 1	Determination of Effect – Alternative 2 & 3
Cypripedium montanum, (Category C)	No	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Nephroma occultum (lichen) (Category C)	No	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species

Species	Presence in Project Footprint	Probability of Effect	Consequence of Effect	Cumulative Effect	Determination of Effect – Alternative 1	Determination of Effect – Alternative 2 & 3
Otidea leporina (fungi) (category D)	Yes	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Ramaria rubripermanens (fungi) (category D)	Yes	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Sparassis crispa (fungi) (category D)	Yes	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Spathularia flavida (fungi) (category B)	Yes	Low	Low	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species
Tylopilus porphyrosporus (fungi) (category D)	Yes	Moderate	Moderate	Minimal	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Cause A Loss Of Viability To The Population Or Species

Strategic and Survey and Manage Fungi

Field surveys were conducted for fungi. However, due to the unreliable above-ground presence of fruiting bodies from year to year, additional analysis is presented below. The mycelium (the non-fruiting portion of the fungus) is generally underground and remains undetected until it develops visible reproductive structures (fruiting bodies such as mushrooms, truffles, corals, puffballs, cups), or the substrate is disturbed, exposing the usually white mycelial mats (Cushman and Huff 2007). Even with above-ground fruiting bodies present, their correlation with the extent and abundance of the fungal organisms underground is unknown. Fungal colonies can range in size from microscopic to many acres and can persist for years or decades. Strategic and survey and manage fungi are known to

occur within the planning area, and habitat is present for other target species. The species suspected to occur are associated with forest floor litter, down woody material, host tree/shrub species, or a combination thereof. While these associations are known, details about the requirements for forest floor litter or down woody material for most fungal species are not well understood, and host specificity is not often known beyond the broad categories of conifers, hardwoods, or plant families within these categories (Cushman and Huff 2007). Hence, for the purpose of this report, the entire Douglas-fir mixed hardwood vegetation type is considered habitat for each fungal species suspected to occur within the area.

Table 6. Direct and Indirect Effects to Sensitive Fungi

Activity	Potential direct effects to Sensitive fungi	Potential indirect effects to sensitive fungi
Tree Thinning using aerial and ground based methods	Potential impacts include damage to the mycelial network, damage to host plants and changes in species diversity following treatment. Degree of impact depends on the method used and spatial extent of impact.	Soil compaction typically results in reduced host root growth, reduced root tip availability for mycorrhizal fungi, and reduced organics needed by saprobic fungi. Fungal biomass decreases with decreased canopy cover and less downed woody debris. Increase in solar radiation and modification of forest floor conditions. Over the long-term resulting in reduced moisture retention and reduced likelihood of colonization by non-weedy fungi.
Broadcast burn	Low intensity fire likely only affects the upper 5 cm of litter and its inhabitants. The majority of fungal species diversity resides in the mineral soil. Potential impacts include damage to the mycelial network, damage to host plants and changes in species diversity following fire. Degree of impact depends on the fire intensity and spatial extent of impact.	The more intensely a fire burns, the greater the indirect impacts to overstory shade and quantity of litter, organic matter and large woody debris. Specific requirements for shade, litter, organic matter and woody debris aren't known for each sensitive fungal species. High levels are probably more important to saprobic vs. mycorrhizal fungi. Loss of organics likely limits moisture retention capability for most fungal species.
Pile burning	Concentrated burning can result in high burn intensity and greater changes in fungal diversity. Direct impacts include damage to the mycelial network occurring in the litter to depths w/in the mineral soil. Because the majority of fungal diversity resides in the mineral soil, more species have the potential to be negatively affected by pile burning than broadcast burn, however effects of piles are more localized.	Loss of litter, organic matter and overstory shade will impact site, over the long-term resulting in reduced moisture retention and reduced likelihood of recolonization by non-weedy fungi. May reduce fungi species diversity.
Road, and landing construct-ion	Extent of impact typically localized. Direct impacts include damage to mycelial network, loss of host plants and loss of organic materials needed by fungi.	Soil compaction typically results in reduced host root growth, reduced root tip availability for mycorrhizal fungi, and reduced organics needed by saprobic fungi. Over the long-term resulting in reduced moisture retention and reduced

Activity	Potential direct effects to Sensitive fungi	Potential indirect effects to sensitive fungi
		likelihood of colonization by non-weedy fungi.
Machine chipping/ mastication	May damage mycelial networks.	May damage or destroy duff and substrate layers on which fungi depend. Deposition of chipped material may result in an excessive increase in organic matter potentially altering duff and substrate chemistry (Cushman and Huff 2007).

Table 6 lists the effects to Sensitive fungi within the Upper Briggs Restoration project footprint. "Potential Impacts" from the ISSSSP website found under the Conservation Planning Tools section was used a reference to determine potential effects to fungi (Interagency Special Status/Sensitive Species Program website). The "Potential Impacts" document cites primary literature which supports these effects determinations.

The Strategic fungi *Elaphomyces reticulatus* is known outside the project footprint from a location near unit 505. This occurrence will be flagged, buffered up to 100 feet, and protected to prohibit any direct impacts from project implementation. Survey and manage fungi species *Otidea leporine, Ramaria rubripermanens, Sparassis crispa, Spathularia flavida, Tylopilus porphyrosporus* will be flagged, buffered up to 100 feet, and protected to prohibit any direct impacts from project implementation. The buffers would prohibit impacts to litter and duff layers, maintain current and micro-climate conditions, prevent damage to and removal of host trees, and prohibit fire impacts to mycorrhizae.

A number of project design criteria inherent to the proposed action will minimize the above mentioned direct and indirect impacts to strategic and survey and mange fungi (if present). Chipping and mastication could occur in early to mid-seral forest stands which probably do not provide prime habitat for fungi. Proposed thinning prescriptions retain old and large trees and promote tree and shrub species diversity. Maintaining a diverse array of host species of varying size and age classes will tend to promote fungal diversity. Additionally, acres of the planning area will be treated non-commercially and acres of the planning area will not be treated. For the most part, a portion of the non-commercial and untreated areas tend to be composed of mature forest habitat and represent the highest potential for fungi occurrence. Thus the proposed action will retain refugia for sensitive fungi throughout the project area.

In sum, although some level of negative impacts and cumulative effects may occur to fungal species (if present) one of the goals of the project is to promote old forest habitat (for Riparian Reserve & Late Successional Reserve, see Siskiyou National Forest Land and Resources Management Plan, 1989) and return fire as a natural agent of disturbance to the landscape. In the long-term, return of fire to the landscape may reduce the probability of a large-scale, high intensity stand replacing fire event. A large-scale, high intensity, stand-replacing fire would likely have a longer-lasting detrimental impact upon the fungal community than the proposed action.

Hence, although the proposed action **may impact individuals or habitat, it will not likely contribute to a trend towards federal listing or, cause a loss of viability to any strategic or survey and manage fungal species.**

IV. DESIGN FEATURES

- **If any target species are found during pre-implementation surveys, flagging will be placed to delineate a protective boundary, which will include up to a 100-ft "no activity" buffer.**

- **All known strategic and survey and manage species will be flagged to delineate a protective boundary, which will include up to a 100-ft "no activity" buffer.**

- **Rogue River-Siskiyou Botany Department will delineate and flag the protective species boundaries.**

***Piperia candida* (white piperia)**

Occurrences in units 7, 22, 38, 13W will be buffered and flagged up to a 50 foot radius. RRS botanists will flag the buffer. No project activities will occur within the buffered area. This species is a member of the orchid family and is dependent on mycorrhizal soils. . Fire can impact the mycorrhizal soil profiles altering the viability of individuals and localized occurrences ultimately leading to mortality. Soil compaction negatively alters the below ground plant structures and fungi mycelium as well as mycorrhizal soils.

Threats to this species include timber harvest, road construction, decommissioning of roads, trail construction, creation of recreation sites, and fire. Threats also include actions that alter the hydrology, moisture, and temperature regimes, disturb the soil and litter layers.

Project activities prohibited within the buffered/flagged areas include:

- No ground disturbance
- No temp roads
- No landings
- No machinery (including ground based tree removal systems)
- No skid trails
- No tree/brush/plant removal
- No canopy disturbance
- No skyline/cable logging over buffered areas
- No slash piling
- No fuel piling

- No pile burning
- No underburning or fire
- Directional fell trees away from buffered areas

Strategic and Survey and Mange Fungi

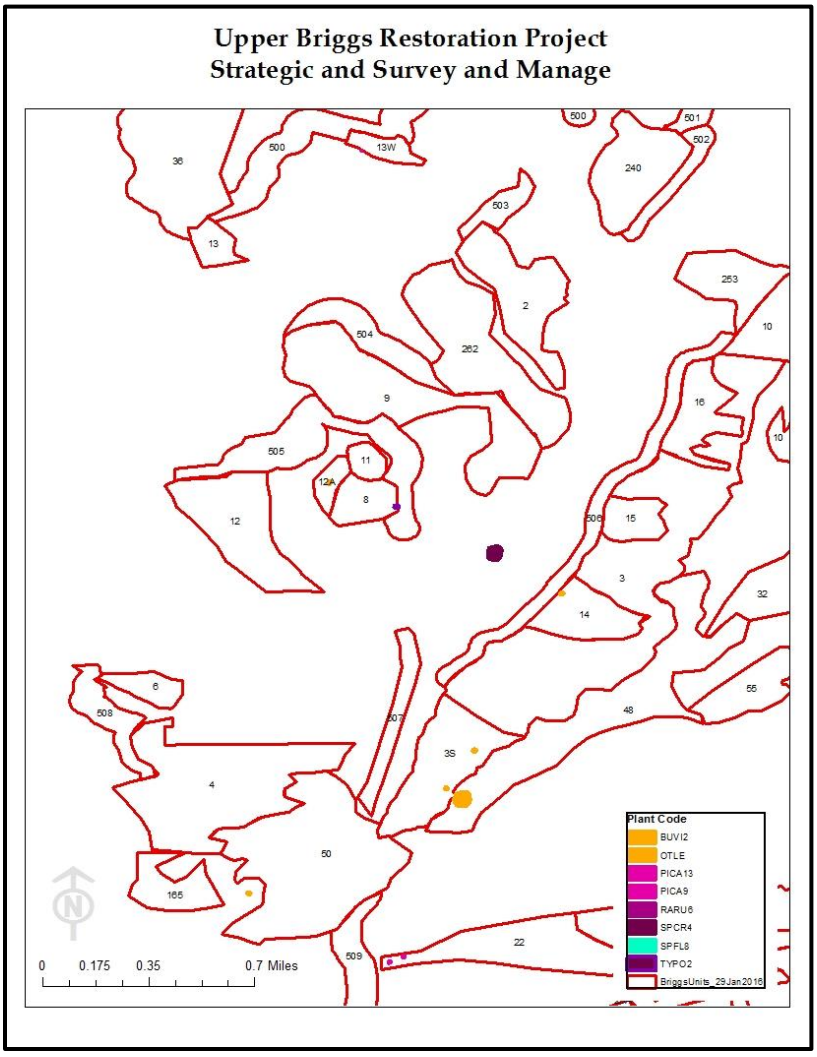
Elaphomyces reticulatus, Otidea leporina, Ramaria rubripermanens, Sparassis crispa, Spathularia flavida, Tylopilus porphyrosporus are strategic and survey and manage fungi species that is dependent on the mycorrhizal soils. Fire can impact the mycorrhizal soil profiles altering the viability of individuals and localized occurrences ultimately leading to mortality. Soil compaction negatively alters the below fungi mycelium as well as mycorrhizal soils.

Threats to this species include timber harvest, road construction, decommissioning of roads, trail construction, creation of recreation sites, and fire. Threats also include actions that alter the hydrology, moisture, and temperature regimes, disturb the soil and litter layers.

All Strategic and Survey and Manage fungi occurrences will be buffered and flagged up to a 100 foot radius. RRS botanists will flag the buffer. There are occurrences in unit 8, 12, 14, 48, 57, 505, 510 and Big Pine campground road loop meadow. No project activities will occur within the buffered area.

Project activities prohibited within the buffered/flagged areas include:

- No ground disturbance
- No temp roads
- No landings
- No machinery (including ground based tree removal systems)
- No skid trails
- No tree/brush/plant removal
- No canopy disturbance
- No skyline/cable logging over buffered areas
- No slash piling
- No fuel piling
- No pile burning
- No underburning or fire
- Directional fell trees away from buffered areas


Upper Briggs Restoration Project
Strategic and Survey and Manage
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SPCR4
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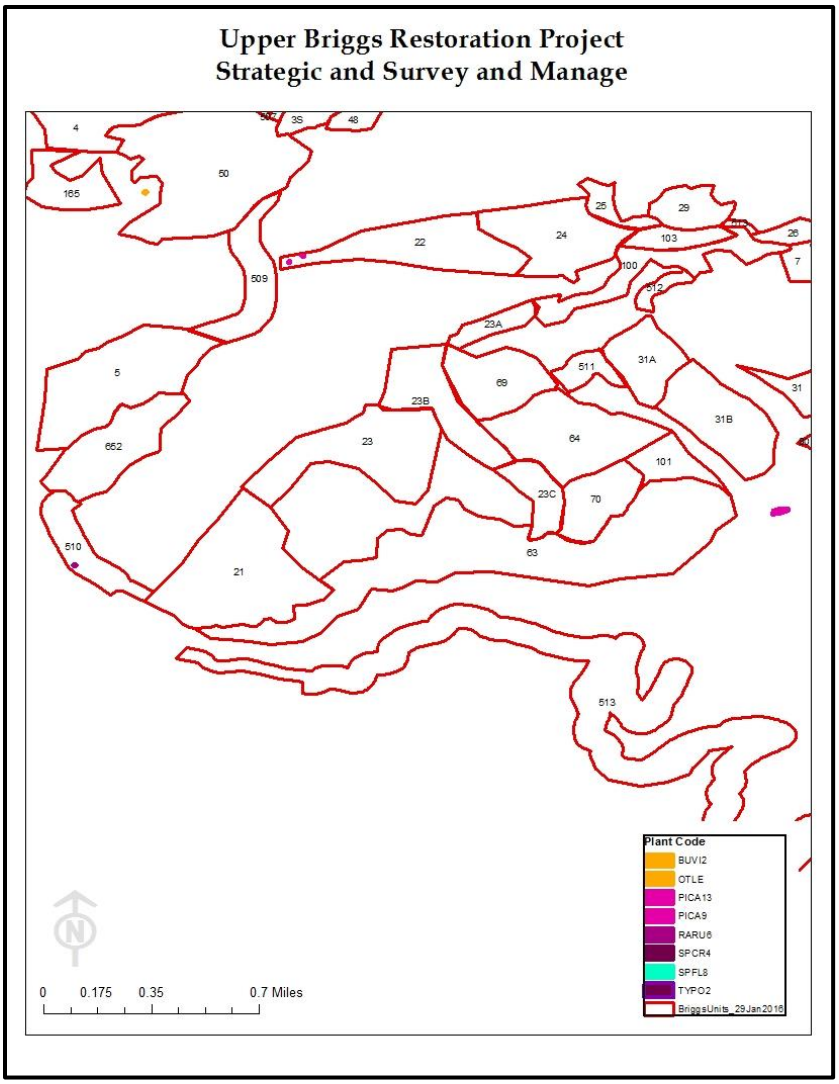
Upper Briggs Restoration Project
Strategic and Survey and Manage
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23B
31B
662
23
64
101
23C
70
510
63
21
513
Plant Code
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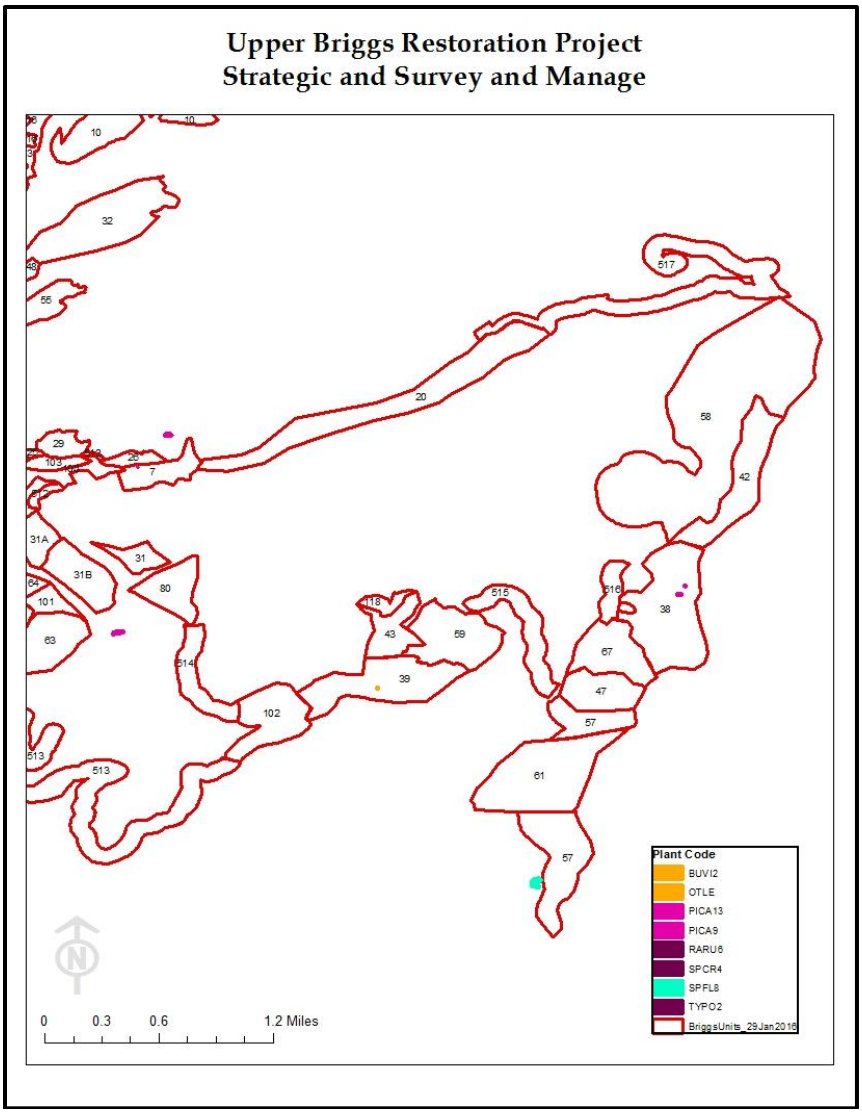


V. REFERENCES

Hickman, J.C., ed. 1993. The Jepson Manual. Higher Plants of California. Univ. of California Press, Berkeley

Interagency Special Status/Sensitive Species Program (ISSSSP) [Online] Available at: http://www.fs.fed.us/r6/sfpnw/issssp/planning-documents/

Nature Serve Explorer. [Online] Available at: http://www.natureserve.org/explorer/servlet/NatureServe?init=Species (Accessed 11/ 2016)

USDA Forest Service 1989. Land Resource Management Plan, Siskiyou National Forest

USDA Forest Service. 2006. Forest Service Manual 2609.25. Region 6

USDA Forest Service and USDI BLM. 2001. Survey and Manage and Protection Buffers, Record of Decision Record of Decision and Standards and Guidelines for Amendments to the

Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Portland, OR

UPPER BRIGGS RESTORATION PROJECT
Invasive Plant Risk Assessment

PREPARED BY: */s/* Stuart Osbrack DATE: February 6, 2017
Stuart Osbrack District Botanist

FOREST SERVICE POLICY

For any ground disturbing activity on ROR-SIS NF it is required to determine the risk of introducing and/or spreading invasive plant species. If it is determined that a project has a moderate to high risk of introducing invasive plant species the project decision document must identify invasive plant species control measures to be undertaken during project implementation (Forest Service Manual 2080, Amendment No. 2000-95-5, effective November 29, 1995).
The manual allows for the use of contract and permit clauses to prevent the introduction or spread of invasive plant species by contractors and permit holders (FSM 2081.3).

NOXIOUS WEED RISK ASSESSMENT DIRECTION

Forest Service Manual 2080 Noxious Weed Management (effective 11/29/1995) includes a policy statement calling for a risk assessment for noxious weeds to be completed for every project. Specifically, the manual states:

2081.03 Policy. When any ground disturbing action or activity is proposed, determine the risk of introducing or spreading noxious weeds associated with the proposed action.

1. For projects having moderate to high risk of introducing or spreading noxious weeds, the project decision document must identify noxious weed control measures that must be undertaken during project implementation.

2. Make every effort to ensure that all seed, feed, hay, and straw used on National Forest System lands is free of noxious weed seeds (FSH 6309.12, sec. 42 and 42.1).

3. Where States have enacted legislation and have an active program to make weed-free forage available, Forest Officers shall issue orders restricting the transport of feed, hay, straw, or mulch which is not declared as weed-free, as provided in 36 CFR 261.50(a) and 261.58(t).

4. Use contract and permit clauses to prevent the introduction or spread of noxious weeds by contractors and permittees. For example, where determined to be appropriate, use clauses requiring contractors or permittees to clean their equipment prior to entering National Forest System lands.

2081.2 Prevention and Control Measures. Determine the factors which favor establishment and spread of noxious weeds and design management practices or prescriptions to reduce risk of infestation or spread of noxious weeds.

Where funds and other resources do not permit undertaking all desired measures, address and schedule noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,

2. Second Priority: Conduct early treatment of new infestations, and

3. Third Priority: Contain and control established infestations.

PROPOSED PROJECT DESCRIPTION

The purpose of this project is to improve the overall resiliency of the Upper Briggs Creek watershed to short-term disturbance (fire, drought, storms) and long-term climate change. Identified needs in the watershed include:

6. Strategically manage fuels to reduce the risk of large stand-replacing fires and reintroduce controlled fire use to the landscape.

7. Maintain and restore structural and vegetation diversity (species composition and successional stages) as appropriate to abiotic and biotic site characteristics in upland areas (prolonging the persistence of legacy trees, accelerating development of late seral forest structure; restoring pine/oak, meadow habitats and rare plant populations).

8. Conserve and enhance habitat for the northern spotted owl and other wildlife species.

9. Maintain and restore the species composition and structural diversity of plant communities in riparian reserves and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration; supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.

10. Re-establish more natural subsurface flow patterns and improve overall watershed function.

Proposed Action (Alternative 2) and Alternative 3

The Wild Rivers Ranger District proposes to treat up to approximately 4000 acres of NFS land in the Upper Briggs Creek watershed. The following proposed activities are collectively intended to contribute to landscape-level restoration within the Briggs Valley area. (Numbers in parentheses refer to purpose statements above).

Develop and Enhance Late Seral Habitat (DELSH)

- Implement treatments (e.g., group selection, patch creation, variable density or radial thinning) to promote sustainable multi-storied stand structure and development of large trees with desirable crown depth in existing mid-seral stands or habitats that lack characteristics of high quality nesting/roosting/foraging habitat for northern spotted owls (2, 3). (Northern spotted owl recovery action 10)

- Use group selection to create small openings or enhance existing small openings in areas with homogenous habitat that lack desired species and structural diversity for owl habitat (2, 3).

- Enhance and protect species diversity through control of the spread of disease agents (dwarf mistletoe and root rot). Increase stand resiliency to western pine beetle and *Ips pini* by variable density thinning (1, 2, 3, 4).

Restore Pine-Oak Communities

- Use a combination of variable density thinning and radial thinning of healthy dominate large trees to 1) reduce mortality of shade-intolerant species such as ponderosa pine, sugar pine, black oak, and white oak and 2) to create conditions where shade-intolerant species can establish. Thinning would include commercial trees, pre-commercial trees, and woody understory species (2, 3).

- Retain and restore pine-oak habitats by removing encroaching species and reducing competition for light and nutrients from existing and remnant pine-oak communities (1, 2, 3).

- Utilize underburning to enhance and maintain healthy pine-oak habitat and assure its persistence in the watershed (1, 2, 5).

Restore Sensitive Plant Habitat

- Reduce canopy cover and create openings for shade-intolerant sensitive plants (2).

- Use techniques to mimic natural disturbances that perpetuate these species, including fire (1).

Restore Meadow Systems

- Remove encroaching tree and shrub species to restore and maintain meadow boundaries (2).

- Improve habitat transition between meadow and forested boundaries (2, 5).

- Utilize broadcast burning to replicate natural meadow disturbance processes (1, 5).

Restore Riparian Reserves

- All project activities within riparian reserves will maintain or improve ACS objectives as defined in the NWFP. Timber harvest within riparian reserves will only occur where needed to attain ACS objectives (4, 5).

- Increase instream coarse woody debris where it is deficient, and ensure adequate future delivery of coarse woody debris to stream channels (2, 4, 5).

- Increase the amount of large downed wood and number of snags in riparian reserves where they are deficient (4, 5).

- Use variable density or radial thinning, group selection, prescribed fire, directional falling, and/or invasive plant removal to improve the diversity and composition of plant species within the riparian reserve to provide adequate

temperature regulation, nutrient filtering, stream bank stability, and amounts of coarse woody debris (2, 4).

Create and Maintain Strategically Located Fuel Management Zones

- Create and maintain strategically located shaded fuel breaks, based on prevailing fire weather conditions and fire behavior; ridgetop fuel breaks will extend to both sides of the ridge (1, 2, 3, 4).
- Reduce ladder fuels through mechanical treatment and underburning (1, 2, 3, 4).
- Reduce hazardous fuels, reduce crown fire potential, and create conditions that reduce the probability of stand-replacing wildfire. Focus treatments on hotter and drier south and west-facing aspects. (1, 2, 3, 5).

Decrease Road Impacts to Watershed Function

- Close, obliterate, or convert to another use those roads that are no longer needed for access. For roads that are obliterated or placed into long term storage use treatments to improve hydrologic function, including: remove culverts at stream crossings; re-contour channels to mimic the natural condition; sub-soil the road bed where necessary to improve water infiltration, soil productivity, and revegetation; place woody debris to decrease erosion and enhance vegetation recovery (5).

The proposed treatments discussed above are categorized by objective in the table below. Total acres displayed exceeds the total treatment area, due to multiple objectives in some treatment units. Overlap acres shows the breakdown.

Table 1. Upper Briggs Restoration Action Alternatives Comparison

Treatment Objective	Activities	Alternative 2*	Alternative 3*
Develop and Enhance Late Seral Habitat	Variable density thinning, gap creation, thin from below; commercial and non-commercial material; maintain with underburning where appropriate	1796	1026
Pine-Oak Restoration	Thin from below, pruning, lop and scatter, pile burning; commercial and non-commercial material; maintain with underburning	714	518

Treatment Objective	**Activities**	**Alternative 2***	**Alternative 3***
Riparian Reserve Restoration	Variable density thinning, to enhance structural diversity and accelerate late seral development; limited commercial material; underburn where appropriate	183	76
Fuel Management Zones	Thin from below with variable density thinning; pruning, lop and scatter, pile burning; commercial and non-commercial material; maintain with underburning	2640	1633
Meadow Restoration	Removal trees encroaching meadow; variable density thinning in meadow-forest interface; lop and scatter, pile burning; commercial and non-commercial material; maintain with underburning	188	188
Rare Plant Enhancement	Habitat creation and enhancement; maintain with underburning in open habitats	333	197

*Total acres designed to meet an objective. Many units are designed to meet multiple objectives, so total acres exceeds the total amount proposed to be treated. Total treatment acres for each alternative is Alternative 2 = 3972 acres and Alternative 3 = 2505 acres total

The proposed treatments above would require the use of the forest system roads and would require approximately three miles of temporary spur roads. Haul route for excess or sale material would use FSR 2500.

Prescribed fire would be used for fuel reduction and to maintain treatment effectiveness over time.

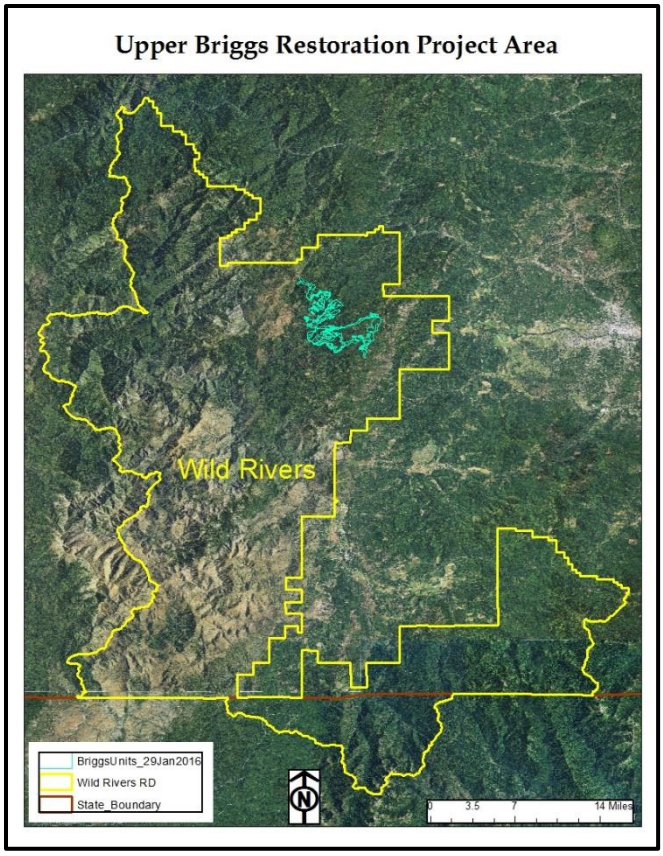
LOCATION

This project is located in the Wild Rivers Ranger District, Rogue River-Siskiyou National Forest in Briggs Valley approximately 9 air miles SW of the Rogue River and 13 air miles WNW of Grants Pass, Oregon. The project area lies entirely within the Briggs Creek watershed which is a tributary of the Illinois River. The entire project area is non-WUI (not wildland-urban interface). A 160 acre parcel of private land (with residence) lies within the

general project area. This parcel is completely surrounded by National Forest lands. The legal description is:

- Selma USGS 7.5-minute quadrangle; Willamette Meridian:

T 35S R 8W Section 25, 31, 32
T 36S R 8W Section 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29



INVASIVE PLANT INFORMATION TRACKED ON THE ROUGE RIVER-SISKIYOU NATIONAL FOREST

Numerous botanical surveys and invasive plant control efforts have occurred over the last decade. During these treatments and surveys workers collected information on target invasive plant species tracked on the Rogue River-Siskiyou National Forest. Invasive plant data for target species are archived in the Wild Rivers Ranger District's invasive plant database. This database was used to create ArcMap shapefiles intended for spatial display & mapping. The invasive plant shapefile & original paper site forms were referenced during pre-field review of the project area.
Through inventory and mapping, FS personnel can assess infestation levels, however only target invasive plant species have been treated and mapped over the years on the Rogue River-Siskiyou National Forest (RR-S NF). I.e., some ubiquitous and/or difficult to control

species (i.e. require extensive use of herbicides and/or are readily spread by birds) such as Himalayan and cut-leaf blackberry have not been mapped or treated. Similarly, a variety of non-native species which are not aggressive invaders have not been mapped (silver hairgrass, rat-tail fescue etc.).
Thus, only species currently tracked and treated will be thoroughly addressed in this invasive plant analysis document. The effects of project related activities upon the spread of species not tracked or treated by the Rouge River-Siskiyou National Forest will be unknown. Through inventory and mapping, FS personnel can assess infestation levels, however only target invasive plant species have been treated and mapped over the years on the Rogue River-Siskiyou National Forest. I.e., some ubiquitous and/or difficult to control species (i.e. require extensive use of herbicides and/or are readily spread by birds) such as Himalayan and cut-leaf blackberry have not been mapped or treated. Similarly, a variety of non-native species which are not aggressive invaders have not been mapped (silver hairgrass, rat-tail fescue etc.). Thus, only species currently tracked and treated will be thoroughly addressed in this invasive plant analysis. The effects of project related activities upon the spread of species not tracked or treated by the RRSNF will be unknown.

RISK ASSESSMENT

INVASIVE PLANTS WITHIN PROJECT AREA

The following table lists the Wild Rivers Ranger District target invasive species present in the Upper Briggs Restoration Project area. There are thirteen species with multiple infestations. Invasive plant surveys and manual treatment (hand-grubbing and/or solarizing with black plastic) of known infestations occurred throughout the proposed planning area. The following Oregon Department of Agriculture (ODA) listed noxious weeds and invasive plants are documented from the project area:

Table 2. Invasive plant species present in the project area

SPECIES ODA NOXIOUS WEED DESIGNATION	LIFE CYCLE	HABITAT PREFERENCE	WRRD TARGET SPECIES
Centaurea debeauxii (meadow knapweed) List B	Perennial forb Reproducing by seed	Best adapted to well-drained, light-textured soils in areas that receive some summer rainfall. This includes ponderosa pine and Douglas-fir forests and shrub-steppe habitats with bluebunch wheatgrass, needle-and-thread, and Idaho Fescue.	Yes
Centaurea stoebe var. micranthos (spotted knapweed) List B and T	Biennial perennial forb reproducing by seed (viable up to 8 years) and lateral shoots	Best adapted to well-drained, light-textured soils in areas that receive some summer rainfall. This includes ponderosa pine (Pinus ponderosa) and Douglas-fir (Pseudotsuga menziesii) forests and shrub-steppe habitats	Yes

SPECIES ODA NOXIOUS WEED DESIGNATION	**LIFE CYCLE**	**HABITAT PREFERENCE**	**WRRD TARGET SPECIES**
		with bluebunch wheatgrass, needle-and-thread, and Idaho fescue. Infestations may change soil conditions to the advantage of this species	
Cirsium arvense (Canada thistle) List B	Perennial forb reproducing by seed and shoots from lateral roots (dormant buried seed viable up to 26 years)	Prefers and is invasive in prairies and other grasslands and riparian areas with deep, well-aerated, mesic soils, but also occurs in almost every upland herbaceous community, especially roadsides, abandoned fields, and pastures.	Yes
Cirsium vulgare (bull thistle) List B	Biennial forb reproducing by seed (viable 3 years or less)	Occurs in dry to moist habitat, fields, pastures, grasslands, roadways, forest clearings, rock outcrops, and along waterways. Does best in areas with moderate slope. It is not shade tolerant.	Yes
Cytisus scoparius (Scotch broom) List B	Perennial shrub reproducing by seed that is long lived	Found in pastures, forest, and wastelands. This nitrogen fixer which has prolific and vigorous growth patterns may have the ability to alter native plant	Yes
Hypericum perforatum (St. Johnswort) List B WRRD	Perennial forb that reproduces by seed and short runners	Rangeland and pastures (especially when poorly managed) fields, roadsides, forest clearings in temperate regions with cool, moist winters and dry summers. Grows best in open, disturbed sites and on slightly acidic to neutral soils. Does not tolerate saturated soils.	No
Lathyrus latifolius (perennial peavine) List B	Perennial vine/subshrub/ forb/herb reproducing by seed and rhizome	Occupies a wide range of climactic conditions thriving in the warm wet environment of the Pacific Northwest to the cold dry conditions of the Rocky Mountain States. Little information has been published	No

SPECIES ODA NOXIOUS WEED DESIGNATION	**LIFE CYCLE**	**HABITAT PREFERENCE**	**WRRD TARGET SPECIES**
		on this species and it is often overlooked as an invader.	
Leucanthemum vulgare (oxeye daisy) Not on List	Perennial forb that reproduces by seed and rhizome	Fields, pastures, waste places, roadsides, railroads, prairies, slopes, disturbed sites.	No
Melilotus officinalis (sweetclover) Not on list	Biennial forb that reproduces by seed	Sweetclover plants inhabit open fields, roadsides, riparian zones, disturbed sites and other communities from low to middle elevations.	Yes
Potentilla recta (sulfur cinquefoil) List B	Perennial forb that reproduces by seed	Aggressive invader of meadows, grasslands and forest openings. It forms dense monocultures. Often invades after other weeds have been successfully removed.	Yes
Rubus armeniacus (R. procerus, R. discolor) (Himalayan blackberry) List B	Perennial shrub reproduced through roots and seeds	It grows as a robust, well-armored producing large impenetrable thickets especially along valley floors. Deep-growing woody roots yearly produce spine covered, reddish stems often extending more than 20 feet per season.	No
Senecio jacobaea (tansy ragwort) List B and T	Perennial forb that reproduces by seed	Invades cut-over forest lands, irrigated and non-irrigated pastures, woodland pastures, and fallow lands. Although it prefers light, well-drained soils in cool, moist climates and rarely is tolerant of high water tables or acidic soils, it can grow in most soil moisture regimes, even where there are hot, dry summers. It can over-winter in areas where temperatures reach -20°F or lower if there is good snow cover.	Yes
Taeniatherum (Elymus) caput-medusae (medusahead grass)	Annual grass	Found in disturbed sites and grasslands. Produces many seeds that germinate quickly year round. It also has roots that grow	

SPECIES ODA NOXIOUS WEED DESIGNATION	LIFE CYCLE	HABITAT PREFERENCE	WRRD TARGET SPECIES
List B WRRD target species		in winter. The roots can reach 40 inches deep, helping the plant use soil moisture and get a jumpstart on spring growth. The plant litter is slow to decompose and inhibits seedlings of other plants. This litter also creates fuel for intense damaging fires. These	No

Preventing and Managing Invasive Plants Final Environmental Impact Statement April 2005
http://www.oregon.gov/ODA/PLANT/WEEDS/pages/profile_perennialpeavine.aspx

ODA Designations

"A" Designated Weed – a weed of known economic importance which occurs in the state in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states make future occurrence in Oregon seem imminent **Recommended action**: Infestations are subject to eradication or intensive control when and where found.

"B" Designated Weed – a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties (Table 2). **Recommended action:** Limited to intensive control at the state, county or regional level as determined on a site specific, case-by-case basis. Where implementation of a fully integrated statewide management plan is not feasible, biological control (when available) shall be the primary control method.

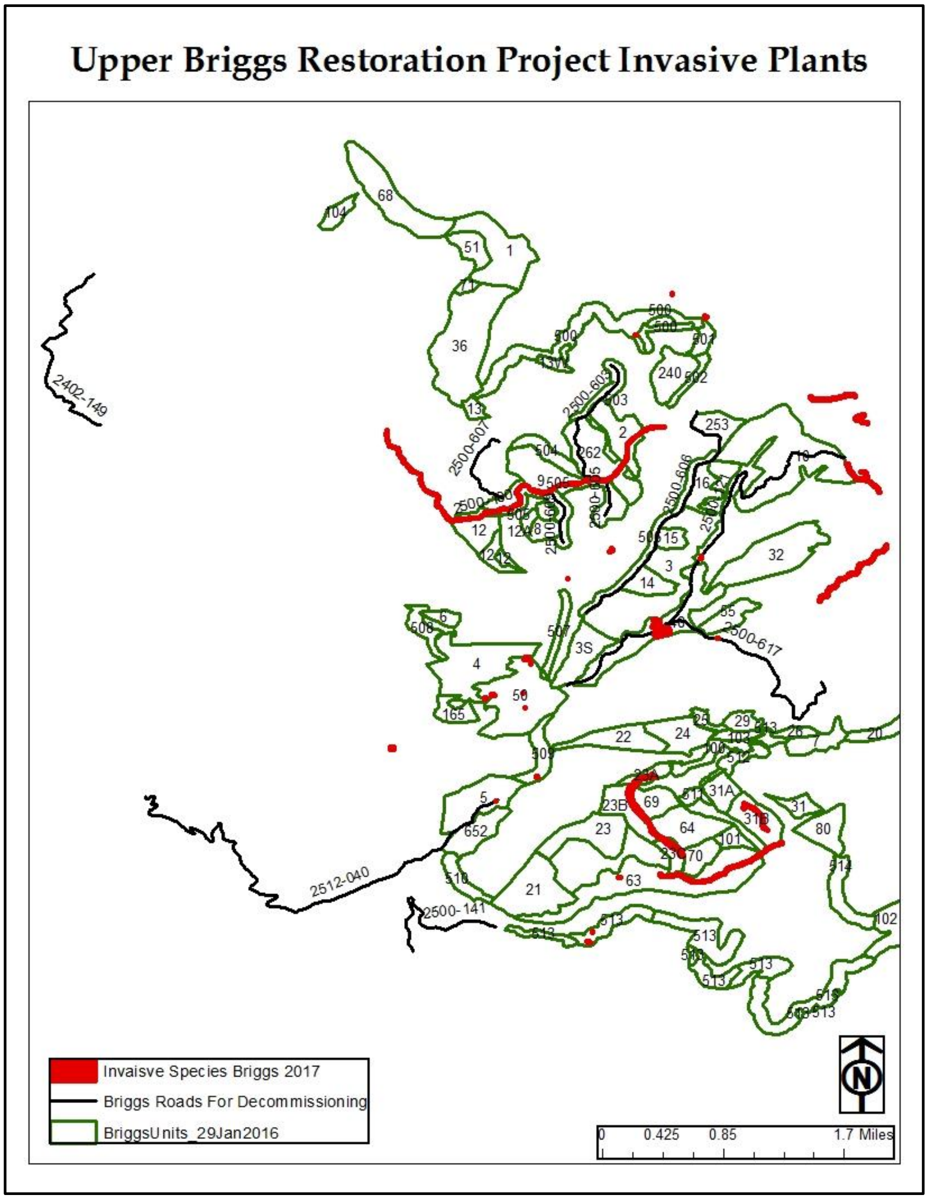
"T" Designated Weed – a priority noxious weed designated by the Oregon State Weed Board as a target for which the ODA will develop and implement a statewide management plan. "T" designated noxious weeds are species selected from either the "A" or "B"

Proposed Action and All Action Alternatives

Table 3. Proposed project invasive plant infestations and FS roads

SPECIES CODE	COMMON NAME	INFESTATION ID	RTE NUMBER	UNIT NUMBER
CIVU	bull thistle	061122_CIVU_0102	2509000; 049	10; 517
CIVU	bull thistle	061122_CIVU_0099	2509015; 025;021;032; 630; 631; 632; 633	10; 20; 517, road decommission 2500032
PORE5	sulfur cinquefoil	061122_PORE5_0002	2500110	19; 505
CIVU	bull thistle	061122_CIVU_0118	2500100; 609	2; 262; 9; 505; 12, road decommission 2500100
CIVU	bull thistle	061122_CIVU_0001	2500138	10; 64; 69; 23A
CIVU	bull thistle	061122_CIVU_0013	2512040	5
CIVU	bull thistle	061122_CIVU_0016	2500141	510; 513
CIVU	bull thistle	061122_CIVU_0095	2500643	31B
CIVU	bull thistle	061122_CIVU_0119	2500640	63
CIAR4	Canada thistle	061122_CIAR4_0138	2500643	31B
CIAR4	Canada thistle	061122_CIAR4_0012	2500128	63
CEDE5	meadow knapweed	061122_CEDE5_0164	2500000	39
CEDE5	meadow knapweed	061122_CEDE5_0165	2500000	513
CEDE5	meadow knapweed	061122_CEDE5_0166	2500121	3

SPECIES CODE	COMMON NAME	INFESTATION ID	RTE NUMBER	UNIT NUMBER
CEDE5	meadow knapweed	061122_CEDE5_0172	2500617	48; 55
CEDE5	meadow knapweed	061122_CEDE5_0174	2512000; 013	50
CEDE5	meadow knapweed	061122_CEDE5_0175	2512635	50
CYSC4	Scotch broom	061122_CYSC4_0168	2512635	50
CEDE5	meadow knapweed	061122_CEDE5_0176	2512000	50
CEDE5	meadow knapweed	061122_CEDE5_0177	2512000	50
CEDE5	meadow knapweed	061122_CEDE5_0264	2500000	500; 501
CEDE5	meadow knapweed	061122_CEDE5_0270	2512013	50
CEDE5	meadow knapweed	061122_CEDE5_0356	2500000	513
CYSC4	Scotch broom	061122_CYSC4_0065	2510000	500
CYSC4	Scotch broom	061122_CYSC4_0106	2512040	5
CYSC4	Scotch broom	061122_CYSC4_0108	2512017	4; 165
MEOF	sweet clover	061122_MEOF_0014	2509; 2500	500; 501
MEAL	sweet clover	061122_MEAL_0007	2500	500; 501
CSTM	spotted knapweed	061122_CESTM_0064	2500000	Haul Route to North
CSTM	spotted knapweed	061122_CYSC4_0117	2500603	9; 262
TACA8	medusahead	061122_TACA8_0003	2500121	3
TACA8	medusahead	061122_TACA8_0001	2500121	48
TACA8	medusahead	061122_TACA8_0004	2500000	50
TACA8	medusahead	061122_TACA8_0025	2512013	50


Upper Briggs Restoration Project Invasive Plants
Invaisve Species Briggs 2017
Briggs Roads For Decommissioning
BriggsUnits_29Jan2016
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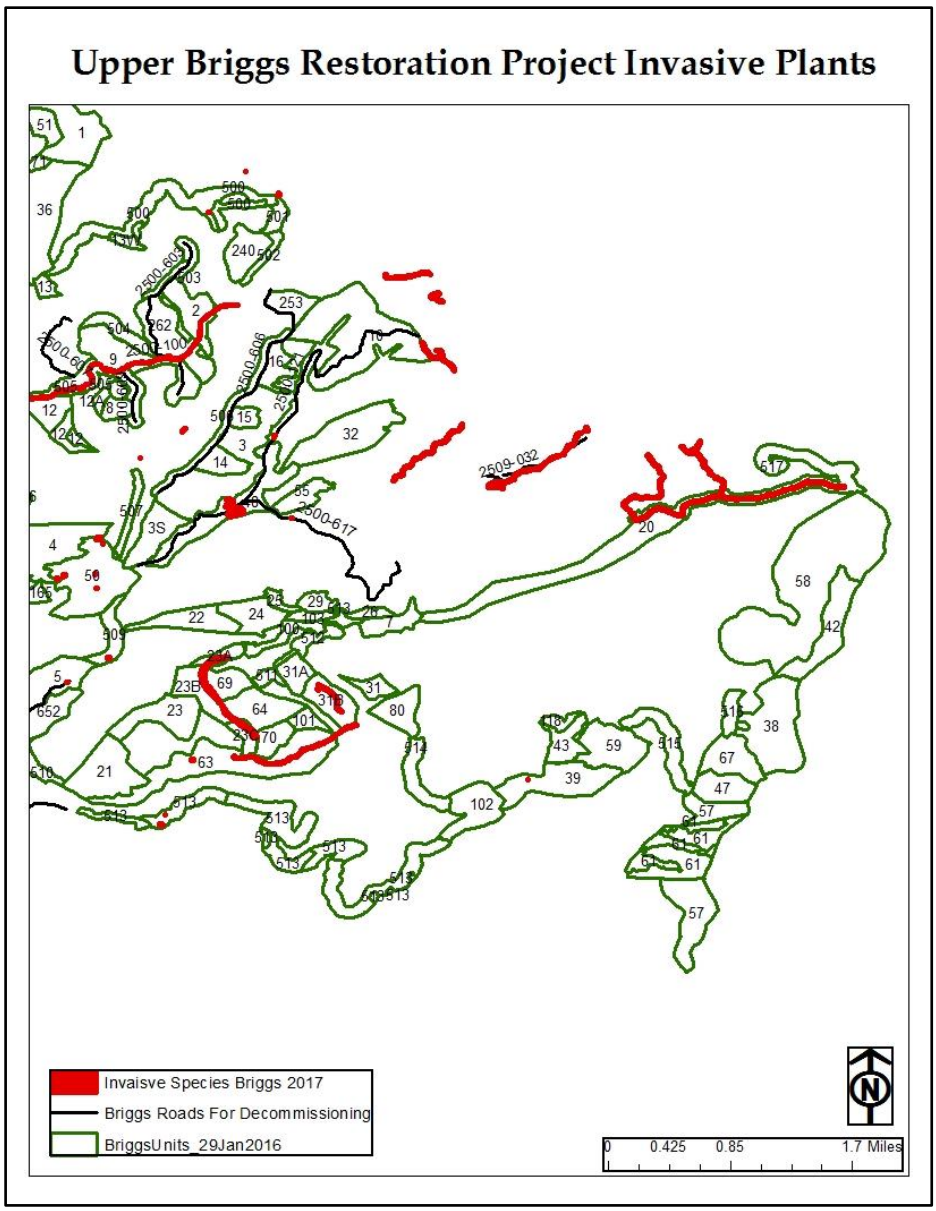


INVASIVE PLANT IMPACTS

(Excerpts from Volume 1, Chapter 3 Preventing and Managing Invasive Plants, FEIS). The presence of invasive plants is not a new phenomenon. But the geographic scope, frequency, and the number of species involved have grown enormously as a direct consequence of expanding transport and commerce in the past 500 years, and especially in the past 200 years (Ewel et al. 1999). Invasive plants can compromise healthy, native ecosystems if they persist and/or increase in abundance over time. Once established, they can be self-perpetuating, and can spread from site to site, often without human assistance (Randall, 1996). The impact of invasion can be permanent when economic and environmental factors limit the ability of a managing agency to restore the ecosystem to a healthy state (National Academy of Sciences, 2002). Invasive plants have already caused permanent damage to public lands across the western United States (Asher and Surrier, 1998).

Table 4: Known Effects of Invasive Plants on Ecosystems

EFFECTS OF INVASIVES ON PLANT ECOSYSTEMS
Habitat change resulting from invasive plants
Alter forage quality
Decrease favored or nutritionally preferred food
Lack of use of favored forage may affect plants previously evolutionarily favored, and affect mutualistic relationship
Disrupt herbivore/plant ecological relationships
Disrupt insect composition and plant relationships (e.g. butterfly/bee/pollinator/plant relationships, with cascading effects to other pollinator/plants.)
Disrupt mychorrhizal fungi through plant changes; in turn, this may affect long-term habitat components pertaining to structure and function of vegetation
Alter fire behavior; which can affect fire intensity, duration, and frequency
Alter soil stability through loss of plant cover, debris, and detritus
Change in local ecology of keystone plant species that has cascading effects on plant and wildlife composition and habitat use (e.g. beach grass, Japanese knotweed)
Change in soil ph and chemistry
Change in soil biota
Habitat fragmentation and increased edge effect
Other effects of invasive plants
Impact to ecosystems already undergoing climatic change
Direct and indirect changes in water availability and moisture regimes
Loss of biological diversity, ecological integrity, and ecosystem structure/function

NO ACTION ALTERNATIVE

There are many target invasive plant and Oregon State listed noxious weed infestations throughout the project area. Known infestations are controlled annually. However, most infestations take years to eradicate, subsequently these infestations may increase in size or spread to non-infested areas. A wide variety of vectors are expected to introduce and/or spread invasive species throughout the project area. Invasive plant seeds can be transported on vehicles traveling from roads with weed infested areas and are expected to spread readily as they are deposited along road sides. Additionally, off road vehicle use is expected and is a common cause of invasive plant introduction and spread beyond the road prism. Finally, introduction and spread of invasive species by recreational activities, human activities, animals, wind, and water may also occur. However, the risk of invasive plant infestations is low under the no action alternative.

Under the no action alternative there would be no direct, indirect, or cumulative affects to native plant communities from invasive plants. The reason for this determination is: no project activities would occur and there would be no equipment or additional vectors present to establish or spread invasive plants and noxious weeds, their seeds or vegetative material within the proposed project treatment area.

ACTION ALTERNATIVES - ALTERNATIVE 2 (PROPOSED ACTION) and ALTERNATIVE 3

HABITAT VULNERABILITY AND NON PROJECT VECTORS

Within the project area there exist several types of habitats and plant communities. Plant communities differ within the project area depending on geology, aspect, slope, available moisture, percent canopy cover, and other ecological attributes. The dominant plant community type is *Psuedotsuga menziesii* (Douglas fir)-*Lithocarpus densifolius* (tanoak). Within the project footprint there exists an overstory of *Psuedotsuga menziesii* (Douglas fir), *Quercus kelloggii* (black oak), *Pinus ponderosa* (ponderosa pine), *Arbustus menziesii* (pacific madrone), *Pinus lambertiana* (sugar pine), *Calocedrus decurrens* (incense cedar) and others. The shrub layer consists of *Lithocarpus densifolius* (tanoak), *Amelanchier* sp. (serviceberry), *Rhamnus purshiana* (cascara), *Corylus cornuta* (hazelnut), *Holodiscus discolor* (oceanspray), *Mahonia nervosa* (Oregon grape), *Salix* spp. (willow), *Ceanothus cuneatus* (buckbrush), and *Ceanothus cordulatus* (white thorn), *Ribes* spp. (current), *Arctostaphylos patula* (green leaf manzanita) *Rosa* spp. (rose), and others. There is a diverse layer of forbs, graminoids, and non-vascular species distributed throughout the project area. There is mixed conifer and hardwood forest, shrub, riparian, meadow, roadside, other ecosystems within the project footprint. Forest areas vary in tree size and age, canopy closure, downed woody debris and decay class. The project footprint ranges from 2200- 4300 feet in elevation.

Additional non project dependent vectors for invasive plant establishment and spread include: existing invasive plant and noxious weed infestations; recreational activities including hikers, bikers, and equestrians; vehicular use of trails and roads; and wind and water dissemination of invasive seeds. In addition, wildlife can spread invasive plants by disseminating seeds from transport on their bodies or through their digestive systems.

Some habitat alterations that may be expected as a result of the proposed project include: ground disturbance activities; creation of staging areas; compaction of soils; creation of disturbed and non-vegetated areas; removal of trees, shrubs, herbs, and grasses; removal of canopy layers, and prescribed fire. All these alterations can promote invasive plant infestations establishment and spread on the landscape.

The proposed project may increase vectors for introducing and spreading invasive plants and noxious weeds with in the project area. Vectors include: increased risk of noxious weed seed introduction from vehicles and machinery, the spread of existing infestations from vehicles and machinery, and the creation of new disturbed and open areas.

DESIRED FUTURE CONDITION

In National Forest lands across Region Six, healthy native plant communities remain diverse and resilient, and damaged ecosystems are being restored. High quality habitat is provided for native organisms throughout the region. Invasive plants do not jeopardize the ability of the National Forests to provide goods and services communities expect. The need for invasive plant treatment is reduced due to the effectiveness and habitual nature of preventative actions, and the success of restoration efforts.

In the past, management standards, goals and objectives for invasive plants came from the 1988 Record of Decision for Managing Competing and Unwanted Vegetation (1988 ROD) and 1989 Mediated Agreement. These documents were integrated into Land and Resource Management Plans (Forest Plans) in Region Six and they remained the overriding management direction. The 2005 Record of Decision for Invasive Plant Standards from the Pacific Northwest Region

Invasive Plant Program, Preventing and Managing Invasive Plants, amends the forest plans by adding desired future condition statements, standards, goals and objectives (2005 ROD).

Table 5. Goals and objectives applicable to this project have been abbreviated from the 2005 ROD; for a complete reference refer to the ROD (October, 2005).

GOALS AND OBJECTIVES MOST APPLICABLE TO PROPOSED PROJECT	
Goal 1 - Protect ecosystems from the impacts of invasive plants through an integrated approach that emphasizes prevention, early detection, and early treatment. All employees and users of the National Forest recognize that they play an important role in preventing and detecting invasive plants.	
Objective 1.1	Implement appropriate invasive plant prevention practices to help reduce the introduction, establishment and spread of invasive plants associated with management actions and land use activities.
Objective 1.3	Detect new infestations of invasive plants promptly by creating and maintaining complete, up-to-date inventories of infested areas, and proactively identifying and inspecting susceptible areas not infested with invasive plants.
Objective 1.5	Control new invasive plant infestations promptly, suppress or contain expansion of infestations where control is not practical, conduct follow up inspection of treated sites to prevent reestablishment.
Goal 2 - Minimize the creation of conditions that favor invasive plant introduction, establishment and spread during land management actions and land use activities. Continually review and adjust land management practices to help reduce the creation of conditions that favor invasive plant communities.	
Objective 2.1	Reduce soil disturbance while achieving project objectives through timber harvest or other activities that potentially may produce large amounts of bare ground
Objective 2.2	Retain native vegetation consistent with site capability and integrated resource management objectives to suppress invasive plants and prevent their establishment and growth

Table 6. Standards applicable to this project have been abbreviated from the 2005 ROD; for a complete reference refer to the ROD (October, 2005).

Standard Number	**Invasive Plant Management Standards which apply to the proposed action.**
2	Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands.

Standard Number	**Invasive Plant Management Standards which apply to the proposed action.**
3	Use weed-free straw and mulch for all projects, conducted or authorized by the Forest Service, on National Forest System Lands.
7	Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists. Treat or require treatment of infested sources before any use of pit material.
8	Conduct road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants in consultation with District or Forest-level invasive plant specialists, incorporate invasive plant prevention practices as appropriate.
13	Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely natural regeneration of the native plant community is not likely to occur.

INVASIVE PLANT MITIGATIONS

Table 7. Invasive plant mitigations

INVASIVE PLANT MITIGATIONS
• RRSNF Botanists will be notified adequately (minimum of two weeks) prior to any project implementation of unit or road area to treat and/or properly flag infested areas in field season. o If implementation is to occur outside of field season then schedule should be relayed to Botany Department in previous field season to adequately treat infestations.
• All WRRD target invasive plants and noxious weed infestations within the project area or along travel routes near the project area will be hand treated where feasible or "flagged and avoided" according to the species present and project constraints. Roadside invasive plant sites would be flagged and/or staked by the RRSNF Botanist/Invasive Plant Coordinator. Infested sites will be avoided or the FS Contracting Officer's Representative or other FS Representative (representatives may include COR/ER/FSR/SA, etc.) would direct contractor to blade or ditch in a manner that reduces the potential spread from infested to un-infested sites (e.g. blading into instead of through from infestations).
• All off-road equipment used on this project shall be washed and cleaned before moving into the project area to ensure that the equipment is free of soil, seeds, vegetative material, or other debris that could contain or hold seeds of noxious weeds. "Off-road equipment" includes all logging and construction equipment (bull dozers, graders, etc.) and such brushing equipment as brush hogs, masticators, and chippers; it does not include log trucks, chip vans, service vehicles, water trucks, pickup trucks, and similar vehicles not intended for off-road use. However, it is recommended that all vehicles, especially large vehicles, are cleaned when they come onto the Forest Service lands or come from a

INVASIVE PLANT MITIGATIONS
known weed infested area. This is to reduce the potential for spreading invasive plants. In addition, the Forest Service would inspect all off-road equipment prior to entry onto NFS lands. o All parts of equipment must be clean including the undercarriage and chassis before transport to the project area or between project areas. o Equipment will be considered clean when visual inspection by FS Contracting Officer Representative (or other FS Representative) does not reveal soil, seeds, plant material, or other such debris. o When working in known weed infested areas equipment shall then be cleaned before moving to other Forest Service system lands that are un-infested or which do not contain the same invasive plant species.
• In order to be in compliance with the 2005 R.O.D. for managing invasive plants, all earth-moving equipment, gravel, fill, or other materials are required to be weed-free. Use onsite sand, gravel, rock, or organic matter when possible. Otherwise, obtain weed-free materials from gravel pits and fill sources that have been surveyed and approved by a RRS Botanist/Invasive Plant Coordinator.
• Minimize the amount of ground and vegetation disturbance in the implementation areas. Reestablish vegetation where feasible on disturbed bare ground to minimize weed establishment and infestation. Re-vegetation is especially important in staging areas.
• Use weed-free mulches, and seed sources. All activities that require seeding or planting must utilize locally collected native seed sources when possible. Plant and seed material should be collected from or near the project area, from within the same watershed, and at a similar elevation when possible. This requirement is consistent with the Forest Service Manual 2000 (Chapter 2070-Vegetation Ecology) policy that directs the use of native plant material for re-vegetation and restoration for maintaining "the overall national goal of conserving the biodiversity, health, productivity, and sustainable use of forest, rangeland, and aquatic ecosystems". Seed mixes must be approved by a RRSNF Botanist.
• Soil moved from an infested site would be disposed of at designated site coordinated by engineers and the District Botanist/Invasive Plant Coordinator.
• Landings or staging areas for equipment, materials, or crews will not be sited in invasive plant or noxious weed infested areas.
• Disturbed areas would be re-vegetated to prevent the establishment or spread of invasive plants and noxious weeds. Areas may be re-vegetated dependent on the requirement and need of each individual site influenced by the activity that would occur at these sites (refer to Upper Briggs Restoration Project Re-Vegetation Plan for specifics).
• Areas with medusahead infestations will be avoided by equipment and all operations. If prescribed fire is to be utilized in these areas it will be coordinated with RRS Botanist o FS road 2500121 o FS road 2512013 (Sam Brown Campground)

INVASIVE PLANT MITIGATIONS
○ FS road 2512 (Sam Brown Horse camp parking lot) ○ Any new infestations discovered
• After the project phase is completed the WRRD Botanist must be notified so that the project area can be monitored for 3 years subsequent to project implementation to ensure additional invasive plant species do not become established in the areas affected by the project and to ensure that known weeds do not spread. Monitoring will result in early detection and treatment of invasive plant sites, thus reducing the cost of treatment and the long-term environmental impacts of invasion.
• Any new invasive plants found in the project area will be documented and the Wild Rivers District Botanist will be notified of the infestation location.

Anticipated Weed Response to Proposed Action

Most documented infestations are currently restricted to the roadsides and similarly disturbed habitats such as old landings; minimal invasive plant infestations are documented within the interior of the proposed units. Well enforced and well implemented mitigations including equipment washing to avoid the spread and introduction of invasive plants will greatly minimize the risk of invasive plant introduction and establishment within currently habitats with no infestations.

Overall, implementation of the proposed activities will result in a net increase in highly disturbed areas, such as new temporary roads, skid trails, landings, and burned areas. The result of creating more highly disturbed habitats is a measurable increase in vulnerability to invasion and establishment by invasive plant species. However, monitoring is the activity most critical to preventing the establishment of invasions. Monitoring allows workers to identify and remove infestations while they are small and easily treated. If infestations are left undetected and untreated it is likely they will become established, build a seed bank in the soil and become increasingly difficult to control. Establishment of invasive plants across an increasingly large area may disrupt herbivore/plant ecological relationships, alter mychorrhizal fungi/plant interactions, alter fire behavior, create cascading effects on plant and wildlife, and damage ecosystem function through alteration of soil and hydrologic properties (USDA Chapter 3 FEIS 2005).

Table 7. Anticipated weed response to proposed action

FACTORS	CURRENT CONDITION	RISK
	Weed spread factors not connected to Proposed Action (pre-existing circumstances)	With project implementation

FACTORS	CURRENT CONDITION	RISK
A. Inventory	Existing infestations of *Centaurea debeauxii* (meadow knapweed), *Centaurea stoebe var. micranthos* (spotted knapweed), *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle), *Cytisus scoparius* (Scotch broom), *Hypericum perforatum* (St. Johnswort), *Leucanthemum vulgare* (oxeye daisy), *Lathyrus latifolius* (perennial peavine), *Senecio jacobaea* (tansy ragwort), *Melilotus oficinial* (sweet clover), *Potentilla recta* (sulfur cinquefoil), *Rubus armeniacus (R. procerus, R. discolor)* (Himalayan blackberry), *Taeniatherum (Elymus) caput-medusae* (medusahead grass)	High
B. Habitat vulnerability	There will be substantial amount of ground disturbance, soil compaction, creation of disturbed areas, canopy removal, and the introduction of fire. The habitats are moderately vulnerable	Moderate
C. Non-project dependent vectors	Existing recreation (hikers, bikers, equestrian), vehicular traffic on roadways through the project area	Moderate
D. Habitat alteration expected as a result of the project	Reduction of trees, shrubs, and canopy cover; change in plant community composition; soil displacement and minor soil compaction; ground disturbance and the creation of disturbed areas	High

FACTORS	CURRENT CONDITION	RISK
E. Increased vectors as a result of project implementation	Use of area will not increase because of project	Low
F. Mitigation measures	If no mitigation measures implemented	Higher risk
	If some mitigation measures implemented	Moderately reduced risk
	If all mitigation measures implemented	Greatly reduced risk
G. Anticipated weed response to proposed action	There is a high risk factor for weed establishment or spread from the proposed project if mitigation measures are not implemented	Moderate risk

SUMMARY

The overall risk of noxious weed establishment as a result of the project is moderate. This determination is based on the following factors:

Table 8. Risk Summary

The overall risk of noxious weed establishment as a result of the project is moderate. This determination is based on the following:
1. There are existing RRSNF target invasive species and Oregon State listed noxious weed infestations within the project treatment area
2. There will large areas of ground disturbance throughout the project analysis area
3. There will large areas soil compaction throughout the project analysis area
4. The will be the creation of newly disturbed areas
5. There will be disturbance from fire
6. Canopy cover and litter layer would be affected
7. Equipment used in the proposed project treatment area may be exposed to and contaminated with invasive plant material
8. There will be the decommissioning of infested roads in the proposed treatment area
9. Mitigations to prevent the spread or establishment of any new noxious weed or invasive plant infestations or spread of existing infestations will be followed

The proposed project area has many RRSNF target invasive plant species. Invasive plants could be established and spread in many ways. Project activities would remove and burn native vegetation and reduce overstory canopy. Contaminated equipment and vehicles could introduce invasive plants into the project area. Vegetation treatments, decommissioning roads, and project implementation can create disturbed and compacted areas where invasive plants can spread and establish. The removal of canopy l**a**yers and the creation of open, disturbed, and bare soil areas could directly and indirectly adversely affect adjacent native plant communities. This could occur when introduced aggressive invasive species out-

compete them. Project mitigations created would minimize establishment and spread of invasive plants.

LITERATURE CITED

Oregon Department of Agriculture. ODA plant programs, noxious weed control [Online] Available at: http://www.oregon.gov/ODA/PLANT/WEEDS/Pages/index.aspx (Accessed 2/2014)

U.S. Department of Agriculture Forest Service, FSM 2000 National Forest Resource Management, Chapters 2070 Vegetation Ecology, 2080 Noxious Weed Management and 2670 Threatened, Endangered and Sensitive Plants and Animals.

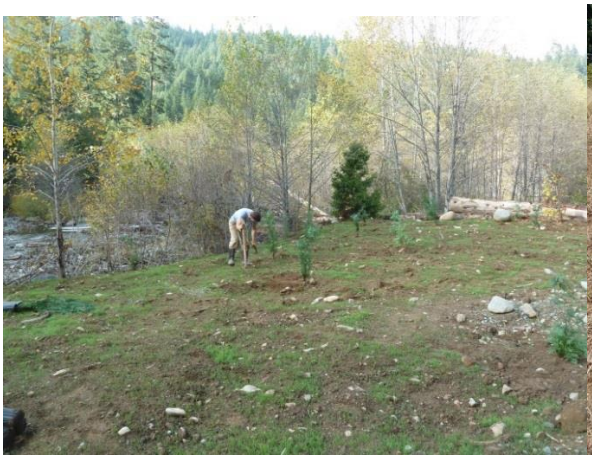
U.S. Department of Agriculture Forest Service Pacific Northwest Region. 1989. Land and Resource Management Plan, Siskiyou National Forest.

U.S. Department of Agriculture Forest Service, U.S. Department of Interior BLM 1994[a]. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Volume II-Appendices.

U.S. Department of Agriculture Forest Service 2005. Pacific Northwest Region Invasive Plant Program, Preventing and Managing Invasive Plants, Final Environmental Impact Statement Vol. 1-3 and Record of Decision

UPPER BRIGGS RESTORATION PROJECT

Re-vegetation Plan




PREPARED BY: /s/ Stuart Osbrack DATE: February 14, 2017
Stuart Osbrack District Botanist

The proposed project area is vulnerable to both erosion and the establishment and spread of invasive plant infestations. Disturbed areas would be re-vegetated to prevent the establishment or spread of invasive plants and noxious weeds. Disturbed areas would also be re-vegetated for soil stabilization and erosion prevention. The following areas could be re-vegetated dependent on the requirement and need of each individual site influenced by the activity that would occur at these sites

- Meadow restoration sites and other areas in need of restoration

- Disturbed areas from project implementation
- Staging areas
- Areas in need of erosion control
- Decommissioned roads
- Roads placed into storage

All plantings would use the appropriate native plants and seeds for the habitats approved by the District Botanist.
Project implementation schedule must be communicated to District Botanist, District Silviculturist, and Forest Soil Scientist well in advance to facilitate rehabilitation and re-vegetation of sites. Adequate advance would have to allow enough time (one year minimum notice) to grow plants and/or purchase native plant materials from disease and weed free nurseries.

RE-VEGETATION SPECIES LISTS

All re-vegetation species would be native and be appropriate for the habitat type and elevation. Table 1: Re-vegetation species may include but not limited to the following:

Plant Species	**Comments**
Chamaecyparis lawsoniana (Port Orford Cedar)	Riparian tree species Must be disease resistant stock and proper elevation band
Alnus rubra (Red alder); *Acer macrophyllum* (bigleaf maple); *Cornus sericea ssp. sericea* (American dogwood); *Acer circinatum* (vine maple); *Salix spp*. (willow species)	Riparian shrub species
Holodiscus discolor (ocean spray); *Corylus cornuta* (hazelnut); *Rhamnus californica* (coffeeberry), *Beriberis nervosa* (Oregon grape), *Ribes sanguineum* (red-flowered currant). *Whipplea modesta* (whipplea), *Linnaea borealis*, (twinflower)	Upland shrub species
Additional tree and shrub species	Species appropriate for site location plant community, habitat, and elevation
Native forb species including pollinator species	Species appropriate for site location plant community, habitat, and elevation

Plant Species	Comments
Native grass seed	Species appropriate for site location plant community, habitat, and elevation

RE-VEGETATION TIMING

Disturbed areas would be re-vegetated dependent on implementation timing. Factors for optimum results for successful survivability would be contingent on life form, species specific, and elevation bands. Re-vegetation would be could potentially be phased due to completion of implementation operations.

Re-vegetation could include erosion control and invasive plant mitigations for establishment and spread of infestations. This could include planting of native grasses in disturbed areas and may be mulched with weed free straw or mulch. Additionally, re-vegetation could include planting trees, shrubs, and forbs. This would conditional on growing season elevation bands.

Disturbed sites with a July implementation completion would be planted with native grass seed (and possibly mulching) for preventing impacts during the initial period. The following fall and/or spring Trees, shrubs, and forbs would be planted during the optimal establishment conditions.

RE-VEGETATION SITES

Re-vegetation would require site specific reconnaissance to ensure the proper species mixture would be selected for the site. Site visits would also assess timing and planting conditions. For Meadow and other restoration areas; disturbed sites; culvert removal and replacement; roads that would be decommissioned; and roads to be put into storage; the following general re-vegetation guidelines would be followed.

Re-vegetation Site Type	Comments and criteria
• Meadow restoration sites and other restoration areas	• Would be planted with the appropriate shrub, herb, or grass species dependent on habitat, soils, elevation; this includes pollinator species
• Staging areas, other disturbed areas	• Would be planted and /or sewn with the appropriate tree, shrub, herb, or grass species dependent on habitat, soils, elevation, and disturbance area.
• Culverts replacement and removal areas would be re-vegetated with the riparian native tree, shrub, forb, or grass species listed.	• Riparian tree and shrub species can be planted in disturbed areas and to the stream channel • Tree and shrubs will be planted in disturbed areas to minimize soil erosion into stream channel and provide bank stability. Grass and

	forbs could be utilized for appropriate site needs
• Decommissioned roads would be seeded with the appropriate native grass seeds and/or trees and shrubs	• The first 100 feet or wherever there is ripping and re-contouring would be seeded with native grass seed and shrubs where appropriate • Disturbed areas may be seeded with native grass seed and mulched with weed free mulch and/or planted with the appropriate trees, shrubs, or herbs for the habitat. • If road is ripped and re-contoured beyond the first 100 feet trees, shrubs, forbs, and grass seed may be planted